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THE VETERINARIAN,

A MONTHLY JOURNAL OF VETERINARY SCIENCE.

AUGUST, 1889.

EDITED BY PROFESSOR SIMONDS;

ASSISTED BY

PROFESSORS BROWN AND AXE.

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BOOKS, ETC., RECEIVED.

It is particularly requested that in future the Foreign Exchange Journals be directed to the EDITOR of the *Veterinarian*, 22½, Bartholomew Close, London, E.C.

The Diseases and Disorders of the Ox, by George Gresswell.

Manitoba Crop Bulletin, No. 22.

Leitfaden der klinischen Untersuchungs-Methoden des Auges, von K. W. Schlampp.

Pleuro-pneumonia in Horned Cattle in Queensland.

The Journal of Comparative Medicine and Surgery, Vol. X, No. 3.

The following foreign publications are to hand:—*Annales de Medecine Vétérinaire*, July, 1889; *Oesterreichische Monatsschrift für Thierheilkunde, und Revue für Thierheilkunde und Thierzucht*, August, 1889; *Archivio per le Scienze Mediche, La Clinica Veterinaria* (Milan), June, 1889; *Recueil de Médecine Vétérinaire*, May, 1888; *Giornale Veterinaria Militare*, No. 7; *American Veterinary Review*, September; and *Journal of the National Agricultural Society of Victoria*, Vol. IV, No. 47.

Papers received: *Mark Lane Express*, *North British Agriculturist*, *Land and Water*, *The Field*, *Live Stock Journal*, *Bell's Weekly Messenger*, *Agricultural Gazette*, *Farmers' Gazette*, Dublin; *Isle of Wight Times*, *Isle of Wight Observer and Chronicle*, *The Isle of Wight County Press*, *The Andover Observer*, *The Gazette*, Montreal; *The Evening Dispatch*, Edinburgh; *The Bournemouth Visitors' Directory*, *Macclesfield County Herald*, and *The Farm, Field, and Fireside.*

NOTICE TO CORRESPONDENTS.

To ensure the publication of Cases and Communications in the coming Number they should arrive by the 15th of the Month.

LETTERS, REPORTS OF CASES, ETC., MAY BE DIRECTED TO PROFESSOR SIMONDS OR THE "EDITORS," AT THE ROYAL VETERINARY COLLEGE, OR TO THE CARE OF ADLARD & SON, PRINTERS, 22½, BARTHOLOMEW CLOSE, SMITHFIELD, LONDON. ALL MORBID SPECIMENS SHOULD BE SENT TO THE COLLEGE, AND DIRECTED TO PROFESSOR AXE.

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THE

VETERINARIAN.

VOL. LXII. No. 740. AUGUST, 1889. Fourth Series, No. 416.

Communications and Cases.

SHORT NOTES OF UNUSUAL CASES OF PARTURIENT APOPLEXY.

By John Hammond, M.R.C.V.S., Bale.

Now that the subject of parturient apoplexy has engaged so much attention in the veterinary and medical professions, I venture to submit to your readers the following short notes of cases which have come under my observation during the last few years, not with the expectation of communicating anything original, but merely to serve as practical illustrations of certain deviations from the usual form in which we encounter the disease.

Case 1, April, 1886.—Crossbred cow, second calf. Parturition was normal, and twelve hours after she was observed to stagger. On my arrival the cow was off her legs and partially unconscious. The disease ran a rapid course, death taking place in less than twenty-four hours from the time of calving. The owner was positive the animal had only given birth to two calves, as he bred her.

Case 2, May, 1886.—Shorthorn cow. In this instance my assistance was sought to deliver the cow of her calf, but to my surprise she exhibited unmistakable symptoms of milk fever, and before parturition could be accomplished was unable to stand. She passed through the usual stages of the disease and was convalescent on the fourth day.

Case 3, July, 1886.—Polled cow. Early on Sunday

morning, July 18th, my attention was directed to a cow said to be endeavouring to calve, and staggering. I found her very unsteady in her movements, and the attendants had some difficulty in keeping her up while I instituted a vaginal examination; the os was only sufficiently dilated to admit the forefingers. I saw the cow at 11 a.m., when she was down, and delivered her of a live calf. The late Professor Robertson, who was staying with me at the time, expressed a wish to see the case in the evening. When we arrived we were a little startled to find our patient with an everted uterus. While I was considering the best course to pursue the Professor had divested himself of his coat and waistcoat in his usual enthusiastic manner, and evidently meant business. We experienced some trouble in returning the womb. The diagnostic symptoms of parturient apoplexy were now most pronounced, and Professor Robertson concurred with me in the opinion that the cow was in a very critical condition. The following day she was slightly better, and in the evening the improvement was more palpable, she having regained consciousness. On July 20th the cow was standing, but her ultimate recovery was considerably retarded by an attack of pneumonia.

Case 4, February, 1887.—Polled cow. This cow showed no indications of being amiss until a fortnight after calving, when she was noticed to have a difficulty in maintaining her equilibrium, and finally went down. She presented the usual premonitory symptoms of parturient apoplexy, and soon lapsed into a comatose condition, but ultimately recovered. This cow had received a limited quantity of mangolds, and I have no doubt if they were not the actual inducing agents of the disease they predisposed the animal to the attack.

Case 5, June, 1887.—Crossbred cow. This cow was reported to be off her legs, and "tail short." The symptoms she exhibited were characteristic of milk fever, and as she had not yet calved I examined her *per vaginam*. The os was dilated, and after a little trouble I delivered the animal of a live calf. After remaining in a recumbent position for two days she rapidly recovered.

Case 6, September, 1888.—Polled cow. This case much resembles the preceding one, but was more acute. The cow was in a semi-conscious condition when the calf was taken from her, became rapidly comatose, and died in twelve hours from the time of parturition.

Case 7.—On Monday, June 10th, 1889, I visited a polled cow with milk fever. She calved the same morning (2 o'clock), but at 12 o'clock was unable to stand. The following evening there was a decided improvement in her condition, and on June 14th she was convalescent.

15th.—This morning I was requested to attend another cow on the same farm, reported to be down and presenting similar symptoms. She occupied a box adjoining the previous animal, in fact was only separated by a few crossbars of wood, so that they had the opportunity of coming into direct contact with each other. The cow was in rather a plethoric condition, and was due to calve in a week (40 weeks being allowed for the period of utero-gestation). Salts had been administered prior to my visit and were operating powerfully.

16th.—The cow is undoubtedly worse, is very restless, and constantly throwing her head to her side. The bowels have ceased to act, and body has become tympanitic.

17th.—The symptoms now exhibited by the animal are identical with those of parturient appolexy, and I think the most experienced veterinary surgeon, without any history of the case, would diagnose it to be typical of that disease. During the course of the day she became unconscious, the lower jaw dropped, breathing became stertorous, and on the following morning death supervened. The fact that this cow had intercourse with another suffering from parturient apoplexy I only regard as rather a remarkable coincidence, and have not recorded it with the view of supporting the contagious theory of the disease.

The general outlines of the treatment adopted are:—As soon as possible from half a pint to a pint of whisky is administered with a purge; and the former continued in smaller doses alternately with Spts. Ammon. Arom. every two, three, or four hours according to the severity of the case.

Continual applications of cold water to the head. When the animal is unable to stand she is maintained in the natural position by means of bags of straw, and turned over at intervals of about six hours. The catheter is passed twice daily. All medicine is exhibited by means of Reid's pump, and I am confident since I adopted this procedure the number of my successful cases has been considerably augmented.

TAYLOR'S HORSE-SHOE PAD.

DERBY.

DEAR SIRS,—I have forwarded you the illustrations of our horse-shoe pads, with circular explaining use of same, &c.

They are receiving considerable attention, and afford the greatest satisfaction to all who have made trial of them. What I wish to impress on horse-owners is, that the frog receives its natural pressure by means of the artificial frog, which also wards off concussion, and as the shoe wears away affords still greater protection against slipping. The price, too, is within the reach of most persons, as one pair of pads will wear out two sets of shoes.

In removing the shoe, care should be taken to thoroughly unclench all the nails, and with a drawing knife to pare away a small portion of the sole, so that it *is lower than the crust.* All ragged portions of the frog are to be rasped off, but on no account should the frog be cut with a knife. In fitting the shoe, many have an objection to its being applied whilst hot, but this in moderation I am not averse to, as it is almost impossible to fit a shoe properly unless a level bearing is obtained from heel to toe and from toe to heel.

After the shoe is fitted, a few "hurds" or tow, smeared with a preparation of tar and linseed meal, should be twisted and put between the frog and heel, spreading it also *thinly* over the sole; then fix the pad and nail on the shoe. I have a great objection to the rasping of the outside of the hoof higher than the nails, after clenching. This should never be done, as it prevents the hoof growing naturally and properly.

THOMAS TAYLOR.

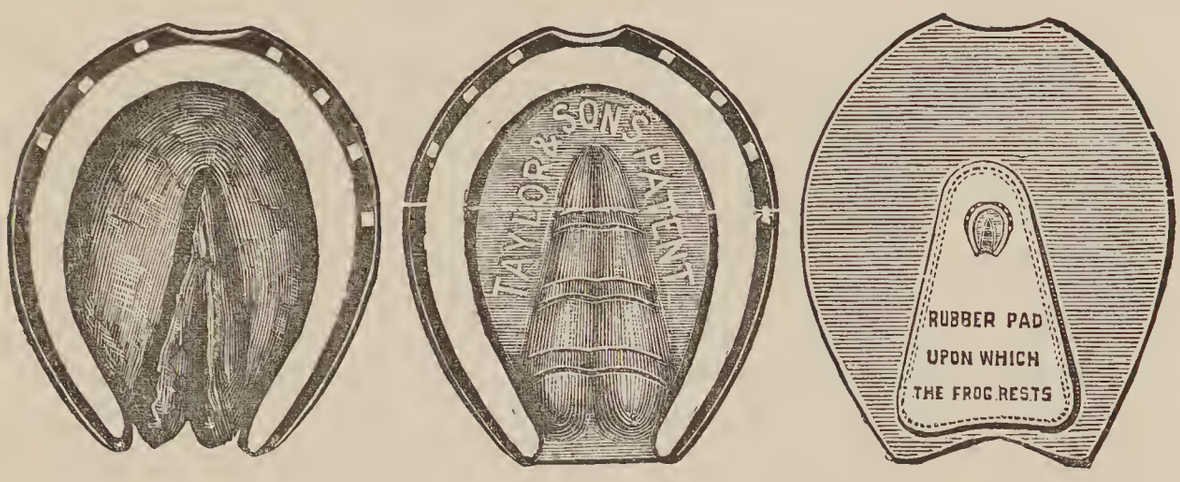
P.S.—I often see horses shod with tips, the frog thus coming into immediate contact with the ground, which is certainly a most fruitful source of navicular disease.

To the Editors of the 'Veterinarian.'

Extract from *Land and Water:*

"Mr. T. Taylor, the well-known veterinary surgeon of Derby, who has had thirty years' experience, and has devoted much attention to the shoeing of horses, and has had the care for that purpose of the extensive studs of Messrs. Bass, Allsopp, Ind and Coope, and others, has patented a pad for fixing under the shoe, which, we think, must prove a very great advantage in not only preventing horses from slipping, but, as the inventor

claims for it, the prevention in a great measure of navicular and other disease. He says, 'Anyone who will examine a horse's foot, shod in the ordinary way, will see the frog is raised half an inch or so from the ground (quite at variance from what nature intended); consequently the frog being thrown out of use, becomes shrivelled and hard, and when at work gets bruised, setting up active inflammation of the synovial membrane of the navicular joint, the result being caries and incurable lameness. The



pads not only allow the frog to receive its natural pressure, but prevent concussion, and, as the shoe wears away, they to a great extent give the horse a firmer hold, preventing slipping on the wood pavements, &c.' And we are very much disposed to agree with all he says. Mr. Taylor has received numerous testimonials from eminent members of his profession. and we strongly recommend our readers to make a trial of these pads, a very fair idea of which is given by our illustrations."

Pathological Contributions.

PLEURO-PNEUMONIA.

In Great Britain during the second quarter of the present year 121 fresh outbreaks of this disease were reported, 61 in England and 60 in Scotland. This is an increase of 5 in the total number of outbreaks as compared with the preceding quarter, but although there has been this increase taking the whole of Great Britain there has been an actual decrease of 9 in the number of outbreaks in England, but an increase of 14 in the number in Scotland. The English counties in which the greatest number of outbreaks took place during the quarter were Essex 9, London, Middlesex, and York (West Riding) 7 each, Lancaster 6, and Kent 4, about two thirds of the total outbreaks in England being in those six counties. In Scotland the disease has been most prevalent in Edinburgh, where 24 outbreaks occurred, and

Fife, in which there were 16; thus two thirds of the Scotch outbreaks were in those two counties.

The total number of cattle attacked during the quarter was 357, or 3 fewer than in the preceding three months; while 1599 healthy cattle in contact with the diseased were slaughtered as compared with 1719 in the first quarter of the year.

In Ireland during the quarter ending June 29th there were 32 fresh outbreaks of pleuro-pneumonia reported; 60 cattle were attacked with it, and 324 healthy cattle exposed to infection were slaughtered.

ANTHRAX.

Of this disease 47 fresh outbreaks were reported in Great Britain during the three months, 41 in England and 6 in Scotland. There were 111 animals attacked, 101 of them in England, and only 10 in Scotland. Of these diseased animals 31 were killed, 70 died, and 5 recovered.

SWINE FEVER.

As is always the case, this disease became more prevalent during the second quarter of the year than it was in the first, the outbreaks, which were 977 in the first, rose to 1557 in the second, while the number of swine attacked increased from 6074 to 7229. The increase of this disease is not surprising when the manner in which the diseased swine are disposed of is taken into consideration; only about half those attacked were killed, 2801 died, 494 only recovered, while the weekly number of diseased swine kept alive varied from 239 to 516, a sufficient number to produce infective material enough to infect every pig in the country.

RABIES.

So far as Great Britain is concerned this disease is confined to certain counties in England; these have been, during the past quarter, Chester, Essex, Kent, Lancaster, Lincoln (Lindsey), London, Middlesex, Notts, Oxford, Surrey, Sussex (East), and York (West Riding). The total number of cases reported was 80, of which 78 were in dogs; 1 head of cattle was affected in Middlesex, and 1 sheep in Essex. The disease was most prevalent in London and adjoining counties, and in York (West Riding). In Ireland 161 cases of rabies were reported during the

quarter; about half these were in dogs, while the other animals attacked included horses, asses, cattle, sheep, goats, and swine.

Facts and Observations.

M. Pasteur's latest Return.—"At the Academy of Sciences M. Pasteur recently presented a note of the results observed in the Pasteur Institute from May 1st, 1888, to May 1st, 1889 (*La France Médicale*, No. 73). During this period 1673 persons bitten by rabid or presumably (*très suspects de rage*) rabid dogs have been treated, 1487 French and 186 foreigners. Of this number—viz. 1673—118 had been bitten in the head or face. Six persons (4 bitten on the hand and 2 on the limbs) had been attacked with rabies during treatment, 4 others were attacked within a fortnight after the close of the treatment. Three persons bitten on the head died after the treatment had been completely finished, and these therefore represent the total cases of failure—viz. in the ratio of 1 in 557. Or, if, 'which would be illogical,' adds M. Pasteur to these 3 cases were to be added the 10 above mentioned, there would still be a mortality of only 1 in 128."—*Lancet.*

Hydrophobia.—An old woman named Mary Bamber, living at Adlington, near Chorley, died yesterday from hydrophobia. Two months ago she was bitten on the arm by a cat; the wound healed, but two days ago symptoms of hydrophobia developed, and she died in terrible agony.—*Times*, July 18th, 1889.

The Importation of Swine into Germany.—Berlin, *July 23rd.*—Referring to the Imperial Order issued yesterday prohibiting the importation into Germany of live pigs, the *Norddeutsche Zeitung* explains that the Order is the result of the measures recently taken by England, France, and Belgium for prohibiting the importation of live stock from Germany. "If," adds the semi-official journal, "the efforts of Germany to stamp out disease have hitherto proved unsuccessful, it is due to the continued importation of diseased animals from the countries lying to the east of Germany, in which the number of infected districts has of late considerably increased." In conclusion, the journal says that the more stringent the precautionary measures taken by Germany are made, the sooner may the removal of the evil be expected. —*Reuter.*

THE VETERINARIAN, AUGUST 1, 1889.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

CURE OF HYDROPHOBIA.

FROM remote times cures for hydrophobia have been offered to the sufferers from that hideous malady, for the existence of which among a civilised people with some knowledge of sanitary science, no excuse can be urged. All the reported cures come to us, as cures always do come, with a guarantee of their absolute efficacy, and all of them have failed. So far, indeed, as medical observation in its most advanced state has been able to determine, the affection in man and beast is certainly and invariably fatal.

It will be conceded on all sides that while past experience is against the probability of cure, it goes no further than this, and the discovery of a specific for rabies would not be held to be contrary to any law in therapeutics or principle of science. No doubt can be entertained of the existence of a poison in rabic virus, and there is nothing out of the common course in the idea that an antidote may be hidden somewhere or possibly is not hidden at all, but only disregarded and overlooked.

In the *Morning Post* of the 11th ultimo a letter appeared which we publish in the present number of the *Veterinarian* (p. 554). The writer refers to the common and successful practice of the native doctors in India in the treatment of persons who have been bitten by rabid animals, and suggests in explanation of the beneficial effects of the administration of a vegetable poison, a variety of stramonium, that it may act as the animal poisons do in the modified virus of variola and rabies in the recognised methods of protective inoculation. To this suggestion there does not seem for the moment to be any reply. We do not know how modified virus acts, and cannot therefore either affirm or deny the identity of the action of a medicinal agent derived from a plant.

M. Pasteur refers the protective action of the dried bulb of a rabid animal to the presence of an antidote of quite unknown composition in the rabic virus. It is equally logical to assume the existence of an antidote in stramonium. In either case the assumption is only useful as an indication of a method of treatment which has to be tested before its value can be determined.

No difficulty need stand in the way of testing the Indian treatment. The plant grows abundantly in the hedges, and it may be taken for granted that the methods of dispensing it can be ascertained. In this country its action in animals which have been inoculated with rabic virus can be determined with perfect safety and certainty.

Nothing is said by the writer in the *Morning Post* of the use of the remedy in cases of actual disease. Probably no attempt has been made to cure hydrophobia when once it exhibits itself in its true character, but a great step would be gained if any medicinal agent could be substituted for the Pasteurian system of injecting rabic virus which, however modified, is allowed to be virulent in the later stages of the inoculation.

Without attempting to decide the controversy as to the efficacy of M. Pasteur's system of preventive inoculation after infection, we do not hesitate to assert that every person bitten by a rabid animal would, if the treatment is equally effectual, prefer having a dose of a potent drug, even of a poisonous nature, to a further dose of the poison which is already in his system.

ORDER OF COUNCIL PROVIDING FOR MUZZLING DOGS IN THE METROPOLITAN POLICE DISTRICT.

We publish in this issue an Order of Council which is now in force under the provisions of which all dogs being at large in the district included in the Order (about fifteen miles round London) must be muzzled in such a manner as to prevent the animals from biting. Certain exceptions are made in the case of dogs while being used for sporting purposes. The Order, unless revoked, will remain in force to the end of the year.

THE RABIES (CITY AND METROPOLITAN POLICE DISTRICTS) ORDER OF 1889.

At the Council Chamber, Whitehall, the day of July, 1889. By Her Majesty's Most Honorable Privy Council.

The Lords and others of Her Majesty's Most Honorable Privy Council, by virtue and in exercise of the powers in them vested under The Contagious Diseases (Animals) Acts, 1878 to 1886, and The Rabies Order of 1887, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows :

Short Title.

1. This Order may be cited as The Rabies (City and Metropolitan Police Districts) Order of 1889.

Extent.

2. This Order applies to and shall be in force in the City of London and such Districts or parts of Districts of Local Authorities as are included within the Metropolitan Police District.

Commencement and Duration.

3. This Order shall commence and take effect from and immediately after the thirty-first day of July, one thousand eight hundred and eighty-nine ; and shall, unless previously revoked by Order of Council, cease to have effect from and immediately after the thirty-first day of December, one thousand eight hundred and eighty-nine, without prejudice to the institution or prosecution of any proceeding in respect of an offence committed on or before that day.

Interpretation.

4. In this Order—

Public place includes any street, highway or thoroughfare, public bridge, royal park, public park garden or pleasure ground, common, uninclosed land, or other place to which the public have access :

The Act of 1878 means The Contagious Diseases (Animals) Act, 1878 :

Other terms have the same meaning as in the Rabies Order of 1887.

Muzzling of Dogs.

5.—(1) No dog shall be allowed to be in or on any public place unless such dog is muzzled with a muzzle so constructed as to render it impossible for such dog while wearing the same to bite any person or animal, but not so as to prevent such dog from breathing freely or lapping water.

(2) If any dog is found in or on any public place without

being muzzled in manner prescribed by this Article, the person for the time being in charge of the dog, and the owner thereof, and the person allowing the same to be in or on such public place in contravention of this Article, shall, each according to and in respect of his own acts and defaults be deemed guilty of an offence against the Act of 1878.

(3) Provided that the provisions of this Article shall not apply to packs of hounds, harriers, or beagles, or to greyhounds or other sporting dogs, while being used for sporting purposes, or to any dogs while being used for the capture or destruction of vermin, and in charge of competent persons.

Seizure and Detention of Stray Dogs and of Dogs not Muzzled or under Control.

6. The Local Authority of each of the Districts to which this Order refers shall cause all stray dogs, and all dogs not muzzled or under control in accordance with the provisions of this Order, to be seized, and such dogs so seized shall be dealt with as follows:

(i) If the dog is affected with, or suspected of, rabies it shall be forthwith slaughtered.

(ii) If the dog is not affected with, or suspected of, rabies it shall be detained in some proper place and be there kept for such period as the Local Authority think expedient: Provided that where the person having charge of or the owner of a dog so detained is known, the Local Authority shall cause notice to be forthwith given to such person or owner of the fact of the dog having been so seized and detained, and the dog shall, without prejudice to the recovery of any penalty for the infringement of this Order, be given up to such person or owner on payment of the reasonable expenses incurred by the Local Authority in respect of such detention.

Food and Water during Detention.

7. A Local Authority, or an Inspector, officer, or constable detaining a dog under this Order shall cause it to be supplied with requisite food and water during its detention; and the expenses incurred by the Local Authority, or by the Inspector, officer, or constable in respect thereof may be recovered from the person having charge of the dog, or from its owner, by proceedings in any court of competent jurisdiction.

Expenses of Local Authority.

8.—(1) All expenses incurred in respect of the seizure or detention of any dog under the authority of this Order shall be defrayed by the Local Authority within whose district the dog was seized and shall be expenses of the Local Authority for the purposes of the Act of 1878.

(2) A Local Authority, in any case where a dog is detained under the provisions of this Order, may recover from the person having charge of the dog or from its owner the expenses in-

curred in respect of the detention of such dog, by proceedings in any court of competent jurisdiction.

Temporary Suspension of Local Authority's Special Regulations as to Dogs.

9. The operation of any Regulation made by a Local Authority under Article 12 of The Rabies Order of 1887 (*Special Regulations of Local Authority as to Dogs*) is hereby suspended during the continuance of this Order so far as any such Regulation may be applicable to any District or part of a District to which this Order applies.

General Provisions of the Rabies Order of 1887, *and Local Authority's Regulations continued.*

10. Subject to the last foregoing Article of this Order, all the provisions of The Rabies Order of 1887 and all Regulations made by a Local Authority under The Rabies Order of 1887 and in force at the commencement of this Order, shall, so far as the same are applicable, continue to apply, during the continuance of this Order, to the Districts or parts of Districts to which this Order applies, unless altered or revoked by such Local Authority.

Extracts from British and Foreign Journals.

RABIES.

We extract the following from the Handbook issued by the Agricultural Department:

Dogs were made animals, and rabies was made a disease for the purposes of certain sections of the Contagious Diseases of Animals Acts, from 1st October, 1886, by Order of Council.

The following is a short description of the most marked symptoms of rabies in dogs:

Change of habits, restlessness, moving from place to place, often hiding in dark secluded corners, depraved appetite, gnawing and eating indigestible substances, altered voice, difficulty of swallowing, but showing no dread of water, thick, viscid saliva hanging from the corners of the mouth, which the dog tries to remove with its paws, frequently snapping at the air or imaginary objects. These symptoms in the furious form of the disease are followed by paroxysms of excitement, in which there is an irresistible tendency to bite and attack other animals, especially dogs; the dog then wanders from its home, biting and snapping

at every animal that may come in its way; emaciation and exhaustion rapidly follow, with loss of nervous power, partial paralysis often supervenes, and the animal drops and dies if it has not previously been destroyed.

In the dumb or torpid form of the disease the premonitory symptoms are followed by dropping or paralysis of the lower jaw, rendering the animal unable to bite or bark; the tongue, swollen and livid, hangs out of the mouth. The dog in this condition seldom leaves its home, but endeavours to remain quiet in some dark place, takes little or no notice of what goes on around it, paralysis of the hind limbs soon sets in, and death quickly follows.

The Rabies Order of 1887 provides that nothing in that Order shall be deemed to affect or interfere with the operation of the Dogs Act, 1871, or any local or other Act of Parliament for the same or like purposes.

It is important to observe that the Dogs Act of 1871 referred to in the Order relates to dogs only, and to no other animals. The Rabies Order of 1887 extends not only to dogs, but also to cattle, sheep, and goats, and all other ruminating animals and swine, as well as to horses, asses, and mules. The Order gives special power to Local Authorities to make regulations for the muzzling of dogs (except in certain cases); for the keeping of dogs under control (the Local Authority having power to prescribe in their regulations what control means); for the seizure and detention of stray dogs, or of dogs not muzzled, or kept under control as prescribed by the Local Authority, and for the recovery of the expenses of such detention; for the seizure, detention, and disposal, including slaughter of dogs being at large and affected with, or suspected of, rabies, or having been exposed to the infection thereof; and for prohibiting or regulating the holding of dog shows.

In exercising these powers, it is suggested that where any regulations are for the time being in force under the Dogs Act of 1871, or under any Improvement or Street Management or other Local Act as regards (1) the muzzling of dogs, or (2) the keeping of dogs under control, it would not be advisable for a Local Authority to make any regulations in regard to dogs under Article 12 of the Rabies Order of 1887 which would interfere with, or conflict with, regulations on the same matters made under the Acts of Parliament before mentioned.

Where no regulations of the kind referred to are in force, it is desirable that each Local Authority should make regulations for their whole district, and not merely for a part in

which rabies may be known or suspected to exist. The regulations under the Rabies Order should include provisions for the destruction of mad dogs, and also of dogs suspected to be mad, and the seizure and detention of all stray dogs.

The general adoption of the muzzle has been proved to be the most effectual measure for the prevention of rabies and hydrophobia. If proper care is taken in the selection and application of the muzzle, its use would not be attended with any cruelty or unnecessary annoyance.

It is desirable that exceptions should be made in favour of packs of hounds, harriers, beagles, or greyhounds, or other sporting dogs, while being used for sporting purposes; and also of dogs while being used for the capture or destruction of vermin, and in charge of competent persons; but there does not appear to be any reason for extending this exception to drovers' dogs, or dogs used for driving animals, as such dogs can perform their work without biting.

The Local Authority may, if they think fit, cause a *post-mortem* examination to be made previously to the disposal of the carcass of an animal (including dog, horse, ass, or mule) that has died of, or been slaughtered on account of, rabies, in which case the owner is bound to give all reasonable facilities.

HYDROPHOBIA.

To the Editor of the Morning Post.

Sir,—While the question of a Pasteur Institute is exercising men's minds, and a somewhat heated discussion is going on in the public press, it may be interesting to invite the attention of those concerned to the very ancient cure for this dreadful disease obtaining in Siam, Burma, many parts of India, and Ceylon, at all events, if not elsewhere. It will be noticed that the following account is a somewhat remarkable confirmation of the principle brought into prominence by the homœopathists, and on which their system of treatment is based. I may here remark that the treatment is so well understood by native physicians that hydrophobia, so much dreaded in Europe, has no terrors for the natives of the countries above referred to, and where, were it otherwise, owing to the great heat prevailing and the generally unprotected limbs of the inhabitants, it is reasonable to assume it would be greatly dreaded and probably of frequent occurrence. The fact that many natives do die

from hydrophobia is owing to the fatalistic feeling so largely prevailing in India, which frequently operates so as to prevent a sufferer from seeking medical aid in any case of illness, and sometimes to poverty, I fear. Again, the contempt (most unfounded and most insane) English doctors feel for their native co-scientists has proved a very serious bar to the acquisition of much most valuable—and few know how valuable—knowledge of the treatment and cure of diseases, in Europe looked upon as practically incurable. I must not, however, be led into this, to me, most seductive question, but at once describe the particular treatment in question. When a man has been bitten by an animal believed to be infected with rabies, and he consults a native physician, the latter at once administers a dose composed mainly of the freshly-bruised seeds of one of the stramoniums (I cannot at the moment indicate by its botanical name the variety referred to, but it is well known and common, growing in almost every hedge-row, I may say) with a little neutral oil. What happens is as follows:—If the animal was not affected as supposed, the patient suffers for about three days from considerable, but not dangerous, constitutional disturbance. He then resumes naturally his normal condition. If, on the other hand, the animal was under the influence of rabies, and the patient is affected, a mild but not dangerous form of hydrophobia is quickly developed, which, in about the same time, viz. three days, runs its course, wears off, and the patient is then considered, and is in point of fact, cured. The precise action on the system is probably analogous to the operation of the introduction of variola for smallpox, or the attenuated virus of rabies for hydrophobia by Dr. Pasteur. I would invite the attention of both the advocates and opposers of the proposed Pasteur Institute to the very well-known fact alluded to above. Believe me, there are vast stores of medical knowledge to be obtained, if properly sought, from native Indian physicians. In confirmation of this statement I may add that one cure for an otherwise considered practically incurable disease I submitted to a very able English physician some years ago, and after a crucial test, he described it to me, as in his opinion, "the most valuable medical discovery of the age." The gentleman alluded to died shortly after, and before he could take further action. I allude to this fact here only for the purpose of showing that there are native Indian remedies not dreamed of by professors of therapeutics in Europe.

Yours, &c., C. TOTTENHAM.

1, Grosvenor-place, *July* 10*th*.

A BILL TO AMEND THE DOGS ACT.

"The Bill introduced by Sir Henry Roscoe to amend the Dogs Act of 1871 proposes to put in force a series of stringent regulations on the subject. The owner of any dog (not specially exempted) that is 'permitted or suffered to be at large' in any part of the United Kingdom without wearing a muzzle 'of a form to be approved by the Privy Council,' shall be liable to a penalty of twenty shillings. The owner shall also be liable for all 'injury done to the person' by the dog, without any proof being required of 'previous mischievous propensity' on the part of the dog, or of negligence on the part of the owner. Every dog must wear a metal ticket with date and number of license, the penalty being as before the seizure of the animal and fining of the owner. Every dog lost shall be reported to the police within three days under pain of a penalty. Any 'appearance or symptom' of rabies shall be immediately reported to the police. Every dog seized by the police shall be examined by a veterinary surgeon, and, if condemned, 'disposed of under the provisions of the Act,' and 'the carcass shall be burned.'"—*British Medical Journal.*

TETANUS.

"The subject of the pathology of tetanus has been greatly discussed at the Paris Academy of Medicine during the present year. It was further dealt with at a recent congress held at the Sorbonne, in a paper by M. Guelpa, who gave the results arrived at by himself and M. Weber (*L'Union Médicale,* No. 79). These are: 1. Tetanus is an infective disease. 2. There is no rheumatic tetanus in the true sense of the word. 3. The tetanic phenomena are not the direct effect of the microbe or microbes, but of toxic agents assisted by these. 4. The microbic multiplication remains confined to the site of entrance of the infection, at any rate during the first symptoms; it being only later, and that but rarely (6 per cent. according to Rosenbach), that any generalisation of the organisms within the body takes place. Treatment, the authors add, should aim at (*a*) the destruction of the bacillary focus; (*b*) the elimination from the organism of the products of the pathogenic microbe; and (*c*) calming the nervous system—*e. g.* by chloral. They further say that the consumption of meat from tetanic animals should be absolutely forbidden."—*Lancet.*

THE MILK SUPPLY AND THE PUBLIC HEALTH.

In view of the serious outbreak of typhoid fever, due to contaminated milk, in Leeds, we publish the following full report of the greater portion of a paper recently read by Mr. S. W. North, Medical Officer of Health for York, at the meeting of the National Association of Sanitary Inspectors held in that city:

In these days, when science has compelled us to recognise the kinship in structure and function which exists between man and animals, and where in increasing numbers the animals we domesticate and reduce to our service have become our companions and neighbours, it seems but reasonable that we should take some cognisance of their diseases, and ask if it be not possible, or even probable, that they may convey to us some of their ailments, or that we may convey to them some of the morbid conditions which affect humanity. This to some extent has already been done; and I venture to think that in the near future it will receive far more attention than it has done in the past. It has long been known that some diseases, of which hydrophobia is an example, may be transmitted from animals to man—malignant pustule, glanders, and others. Recently some evidence has been shown that an eruptive disease on the udders of cows may give rise to scarlet fever in the consumer of the milk. Tuberculosis, however, stands in the front rank for importance. Once let it beyond all doubt be shown that tuberculosis is transmissible from animals to man, and we lay hold of a cause of disease which slays its victims by thousands. Tuberculosis is known to prevail among bovine animals, and most extensively among that class which constitute the dairy cattle of our large towns. It has been proved that animals fed on tuberculous flesh speedily contract the disease,—that tuberculous matter injected under the skin of a healthy animal gives rise to the disease in that animal. The ingestion of the milk of tuberculous animals seems capable of producing the disease in the animals which so use it. The milk of tuberculous cows is known to contain the specific micro-organism which Koch and others believe to be the true agent in the production of tuberculosis in both men and animals. The tuberculosis of animals is regarded as identical to that of man. The same defective hygienic conditions which favour the development of this disease in man favour its production in

animals. Deficient light and air, dampness of sheds, overcrowding, imperfect ventilation, bad and insufficient food, filthy surroundings, all favour the development of tuberculosis, both in man and beast. All conditions which tend to lower the standard of health and impair nutrition increase the susceptibility to tuberculosis. These conditions we know are common enough in the surroundings of most of the milk producers, especially in large towns. The facts in support of these views are well set forth in a departmental report on pleuro-pneumonia and tuberculosis published last year.

These diseases have so important a bearing on the public health, and are so intimately associated with the milk trade, that I commend their consideration to the attention of the Society as one of special importance. In the sequel I propose to suggest the direction in which our duty and that of sanitary authorities lies in dealing with these diseases of cattle from which a large part of our food supply is derived. However important the diseases of animals may be in their influence on the general health of a community, they are by no means the only channel through which the milk trade may become a factor in the production of disease. It is well known that milk readily absorbs the emanations from things among which it may be placed; oranges, for example, and onions, readily impart their flavour to milk stored in the same closet; so milk will not keep in the presence of putrefaction of any kind, simply because it readily absorbs the putrefactive organism. Milk is a medium in which many micro-organisms flourish and multiply. In many forms of disease emanations are given off from the surface of the body or the lungs which, diffused through the air, find a resting-place in whatever may be near, be it solid or fluid. These particles being in many instances minute organisms, or containing the germs of such, readily multiply in milk. Persons in health give off emanations which are poisonous to those who breathe them in any large quantity. These simple facts are fully realised. We see without difficulty how numerous are the conditions under which the milk trade may seriously endanger the public health, and why it needs to be regulated. Water readily absorbs and conveys these unwholesome things; water of necessity is used in the milk trade; sometimes it is said to be the chief source of profit. Unwholesome matters given off from the human body or contained in the secretions may find their way into privies, drains, or cesspits, or even on to the surface of the ground, to be redistributed in the air whenever temperature or other circumstances may lift them up

Milk may in this way become contaminated with the elements of disease, or contaminated water may be used in cleansing the vessels or in diluting the milk. The knowledge and experience of those I address will afford countless illustrations of the method by which in this way the milk trade may become an agent in the spread of disease. The observations made during the past twenty years have abundantly shown that polluted milk is a source of no small danger to the community, a danger comprehensive enough to justify the most stringent regulations. Scarlet fever, diphtheria, and typhoid fever have over and over again been proved to be distributed by the agency of milk, the diseased secretions of the sick having become mingled with the milk either by direct absorption from the surrounding air, or indirectly by its being mixed with water contaminated in some one of the many ways we know to be not only possible but very easy. To show the danger to which the milk trade exposes the public let me briefly describe how milk is sold:

No. 1. At the street corner you may see two or three milk hawkers dealing it out to one another, mixing all sorts of milk, new and old. Such milk keeps badly; all trace of its origin is lost.

No. 2. A bowl or other vessel stands on a table in the living-room of the seller, with children about, whose fingers, not always of the cleanest, find their way into it.

No. 3. The bowl or other vessel containing milk stands on a counter in the midst of vegetables and other matters, exposed to the emanations from every customer who may enter the shop.

No. 4. The milk is stored in a closet or pantry in the living-room with the remains of food cooked and uncooked, to say nothing of sundries not nice to think about.

No. 5. The dairy is used as a wash-house, and the milk exposed to foul linen.

No. 6. Milk is sold by persons nursing sick children. I have seen a case of scarlet fever in the shop, and a child sick of the same disease in the arms of the person serving.

No. 7. I have seen milk kept for sale in large quantities in the living-room of a small house in which there were four cases of scarlet fever.

No. 8. I have seen milk sold by persons who were nursing bad cases of typhoid fever, such persons passing with unwashed hands from the sick room to the shop.

No. 9. With few exceptions, milk sold by small dealers is exposed to human emanations, and to the emanations

from sick people. The retail dealers in milk such as I have described sell quantities from a gallon or two to twenty or thirty gallons daily. For the most part they know nothing of the premises from which it came, and at times forget of whom they have bought it. Such are the dangers to which the public health is exposed through the agency of the milk trade. What are the remedies? Nothing short of the most rigid supervision from the cow to the last distribution. No man should be allowed to produce milk for sale as human food unless his cattle and his premises are subject to careful and systematic inspection by competent persons. The whole of the milk-producing cattle should be seen, examined at short intervals by a skilled veterinary surgeon, diseased animals being at once removed, and the sale of their milk stopped. No man should be allowed to sell milk within the area of any sanitary authority without a special license to do so; such license to be granted by the authority in whose district he proposes to sell milk; such license being withdrawn or suspended by the same authority whenever sufficient reason is shown. The premises and the cattle of every producer of milk—no matter where he lives—and of every intermediate vendor should be open to the inspection of the sanitary authority of the district in which the milk is sold. In distant places, the sanitary authority of the district in which the milk is sold should have the power to appoint local persons to inspect for them, or require a special report from the sanitary officer of the district in which the cattle or the premises on which the milk is dealt with is situated. No milk should be stored or sold on any premises which are not wholly detached from the living- or sleeping-rooms of the inhabitants of the house or other persons. Every producer of milk and every vendor of milk should be bound to report to the sanitary authority of the district in which such milk is sold the occurrence of any disease among the cattles, or the person of his household, or those engaged in the preparation or distribution of the milk. The Local Government Board, or some other similar authority, should prepare regulations, showing the minimum requirements below which no Local Authority should be allowed to license any premises. All petty shops and similar places should be closed against the sale of milk, and none licensed except such as are properly constructed and kept. Mr. North added that he had said nothing as to the Dairy and Cow-sheds Order, because he thought it was of little use, and fell lamentably short in every important particular.—*Yorkshire Post.*

MULTIPLE TUMOURS OF BONE.

At a recent meeting of the Pathological Society Mr. W. G. Spencer showed specimens of mutiple symmetrical tumours of bone from a dog. The specimens, consisting of bones of the fore and hind limbs with the tumours on them, showed the following points—viz.: (1) Symmetry, both on fore and hind limbs; (2) the tumours advanced from the extremities as far up the fore limbs as the hind limbs; (3) the progress consisted in the growth of separate tumours from the bone which had fused with one another into lobular masses; (4) the tumours commenced on the dorsum of the fore and hind feet and extended upwards; tumours in the early stage were seen in the lower part of the femur and humerus, apparently commencing in the bone below the outer layer being parosteal rather than periosteal in origin. The dog from whom the specimens were obtained was a fine valuable collie aged two years, having been well cared for and with no history of an accident. The disease had been noticed twelve months before as small tumours on the dorsum of the feet, which had grown much during the last six months. The tumours felt extremely hard; they caused no pain except towards the last, when slight tenderness was manifested on handling. The dog became very fat in confinement; it was killed, and no further pathological lesions were found except a scar on the lung, apparently from a parenchymatous rupture. On the limbs the skin and subcutaneous tissue, including the under surface of the feet, were normal. On the dorsum of each foot there was a mass of growth, and another surrounded the tibio-fibular and radio-ulna. The femora and humeri showed slight protuberances of bone, but there were no changes in the soft parts covering them. The tumours were not circumscribed; they had involved the muscles, and the tendons ran through and into them in grooves; fibrous extensions of the growths surrounded the tendon sheaths beyond the limits of the tumour. The tumours were fibrous on section, and a little below the surface the knife arrived at extremely hard bone, forming the base. Microscopically, the structure was that of a fibro-myxoma. Three photographs and three drawings were shown to illustrate the condition.

Dr. Payne thought the symmetrical arrangement suggested multiple exostosis.

Mr. Bowlby said that the number of bones affected, and the thickening of the soft tissues over them, suggested inflammation rather than new growth.

HEREDITY.

By Mr. Wm. Warfield.

"The following article from the pen of this well-known writer has been contributed to the *Breeders' Gazette* (Chicago) :—'Mr. Darwin, in his interesting and instructive work on 'Animals and Plants under Domestication,' says: 'Some writers, who have not attended to natural history, have attempted to show that the force of inheritance has been much exaggerated. The breeders of animals would smile at such simplicity.' We may, perhaps, dissent somewhat from the conclusions which the learned scientist reached in some of the speculations which he indulged in, but we must grant that as an investigator of nature and studious collector of facts concerning the phenomena of the animal and vegetable kingdoms he has had few equals. The scientist wisely sees in the great army of practical breeders a host of careful observers whose observation and experience are worthy to rank with his own. The breeders of cattle and other domesticated animals, then, were really the pioneers in this field of research. While this is so, and on the testimony of the widespread acceptance of this idea of the influence of the power of inheritance among 'breeders of animals'—to wit, among us, good fellow-breeders—it may not be unprofitable to take the time once in a while to examine even so well-accepted a theory, if only to satisfy ourselves that it is so well established. However high the hill, and however strong the walls of the lofty stone-rampired fortress, the daily rounds of inspection go on to see that no breach has opened in the impregnable walls through which some unknown but possible foe might enter. And so I am going to take a brief glance at this good old field which is for me always interesting.

"Says M. Ribot, the noted French writer on the subject of heredity: 'Heredity is that biological law by which all beings endowed with life tend to repeat themselves in their descendants; it is for the species what personal identity is for the individual. By it a groundwork remains unchanged amid incessant variation; by it nature ever copies and imitates herself. Ideally considered, heredity would only be the reproduction of like by like. But this conception is purely theoretical, for the phenomena of life do not lend themselves to such mathematical precision; the conditions of their occurrence grow more and more complex in proportion as we ascend from the vegetable world to the higher

animals, and thence to man.' This extended definition, embracing as it does certain observed practical qualifications of the ordinary theoretical rule, is a very good one. At the same time the old and long-accepted definition or statement of the law, namely, that 'like produces like,' has much to commend it. It has brevity, that essential to a good definition—to stamp it as good coin; and then the very fact that the highest expression of the law, 'the ideal,' if you please, is hardly against it. If the conditions under which the law operated could be made single and kept free from the interference of outside and distracting conditions the results would conform almost certainly to this form of the rule. Of course we must have it clearly before our minds that nature never tends to lose the individual in the class. This M. Ribot evidently wished to accentuate. Every species is distinctly and unmistakably to the trained eye differentiated from every other; so, too, the individual. We might add that the same is true of every wider classification on up through genera, groups, to kingdoms. Thus we recognise the marks which differentiate the bull we own from every other shorthorn, and at the same time that we mark this individual character we no less note that he is a shorthorn, a bull, a ruminant, an animal. Many people cannot tell one sort of sheep from another, or one animal in a flock from the rest; but it is only because their eyes are not trained to distinguish the individualising marks. A close observer may even trace family lines among a flock. So far does this individualisation go that it is scarcely possible to find two leaves upon a tree of the largest size and most luxuriant foliage that are identical. I do not know that this has ever been done. At the same time the lines of each class are plainly marked, and the law of inheritance operates in the most regular and broad way. To quote M. Ribot once more: 'Heredity extends over all the elements and functions of the organism; to its external and internal structure, its maladies, its special characteristics, and its acquired modifications.'

"Who is there who has not noticed the oft-recurring resemblance of parent and child? Among horses this is very often to be observed in a most striking way. The Pachens and Hambletonians among trotters have wonderfully well fixed on them the appearance, character, and gait of their sires. That great sire of racers, old Lexington, produced countless racers and mothers of racers upon whom he had his own nature so indelibly marked that the inheritance is constantly blessing them to the fourth generation, despite

the utmost vicissitudes of intermediate bad breeding. I have been particularly struck by an instance of transmission of a mere trick or a habit by a stallion, which was recently communicated to me by Major B. C. Thomas. His celebrated King Ban had a peculiar way of standing with his fore legs crossed, and every year quite a number of his colts would do the same, almost from the time that they were foaled. This is a very fine illustration of how far the operation of the law extends. A similar case is cited by an old authority of a man who slept with his legs crossed transmitting the habit to his child.

"Every physician is familiar with cases of the occurrence of more than five fingers and toes, and of the recurrence of this peculiarity in the same family again and again. This inheritance of an abmormal peculiarity is of course less likely to occur than that of a normal feature. They are generally more striking, however, and more likely to be recorded. Perhaps there are few stock-breeders who have not noticed how a white spot in the flank in otherwise red cattle will pass from generation to generation. My old stock-bull Baron Butterfly rarely failed to thus relieve the monotony of a solid red. So also a blazed face in horses and a Roman nose in men may be traced through many generations. Thus the Valois nose in the family of that name who ruled over France in the sixteenth century was not only remarkable, seeming to spring as it did out of the middle of the brow, but also remarkably persistent.

"Very notable are the observed cases of inherited fecundity and the reverse of this trait, *i. e.* infertility, although tending rapidly to destroy itself by stopping production, is scarcely less notable. We find a good example of fecundity in imp. Young Mary, who bred to the age of twenty-one, and produced no less than sixteen heifer calves, besides several bulls. From these heifer calves sprang a most numerous progeny, and the family has widened and widened under the impulse of the old cow's fecund blood till the Young Marys are perhaps the largest family of shorthorns in America. On the other hand some families are so infertile that, while of fashionable blood, and every device of human ingenuity has been used to secure all the produce from them that was possible, they have yet dragged along generation by generation, breeding a few calves at best and then becoming absolutely barren, while many of the females have proved non-breeders from the start, and some of the bulls impotent or nearly so. These cattle have, in some cases, passed their infertility over into even fecund stocks. This

is upon a well-recognised subdivision of the practical working of this law, which may be summarised as follows:

"In every animal there is the general animal nature, and there is besides the distinct sex character. Besides the primary characteristics there are secondary sex characteristics, such as the hackles, and comb, and spur of the cock; the horns of the ram in some breeds of sheep; the milking qualities of the cow and other females, &c. Now, it is perfectly well established that a cow that is a fine milker will transmit the tendency to her male produce, in which it will remain latent till it is handed on to his female get, when it will again appear. Cross a game bantam cock on a Sebright bantam hen (the cocks of which variety have no tail plumes or hackles), and from the hens of the cross-bred back to a Sebright cock, cockerels with tail plumes and hackles will be bred in a good proportion of cases. This in the simple case of an alternate generation is the transmission of a secondary sex quality latent in the intermediate generation of the opposite sex. If extended to a longer scale it would be *atavism*, or reversion to a remote ancestor. Now, we see that bulls sprung of very infertile families, even when fairly regular breeders themselves, often produce females which inherit the female infertility of the sire's dam. Hence it is important in selecting a bull to learn whether he comes of a fecund family or not, no less than it is in choosing the females for the herd. There is a strong tendency in families to the same term of life and to the same term of breeding, which is logically closely connected with the question just now before us from the breeder's standpoint. Some families of cattle breed with the utmost regularity to fifteen, sixteen, or more years, while others rarely breed beyond ten or twelve. Some families, too, show a tendency to die young without any sign of transmitted disease. In them there was an inheritance of short life, and when the end of the period came the organism just seemed to give way. Nor is this contrary to human experience. I have known families characterised by both long and short lives; and more than one instance of families in which there seemed a double period, so that if the members survived the fatal lustrum next immediately following their fortieth year, fatal alike to men and women, they were like to live to extreme old age.

"But I am prolonging this paper beyond what I intended. I will not venture to say even a word of such special cases as those of 'atavism' and 'prepotency,' in which heredity asserts itself with special vigour on one side, or of the ex-

ceptions contained in the operations classed under 'atrophy' and 'variation,' but shall content myself with these desultory words upon a broad and rich subject. They are indeed too fragmentary to do more than suggest the great field from which they are taken, being like a phial of water brought from the great ocean, or a daisy plucked from a sunny hill slope, and no more capable to give an idea of all the wonders of heredity than the little phial of water of the tumultuous surges of the sea, or the tiny flower of the green slope starred with white and gold, and agleam with the first rays of the morning sun."

ON PREVENTIVE INOCULATION.

The Croonian Lecture delivered before the Royal Society by M. Roux on behalf of M. Louis Pasteur, Membre de l'Institut.

Introduction.—Jennerian Vaccination.—The Discovery of the Artificial Attenuation of Virus.—Pasteur's Researches on Ferments.—Researches on Chicken Cholera.—Attenuating Influence of the Air.—Anthrax Virus: its Attenuation or Intensification.—Preventive Inoculation for Rabies.—Statistics of Treatment at the Pasteur Institute.—The Poisons Manufactured by Microbes.—The Physiological Question.—The Action of Phagocytes.—The Search for Antidotes.

Gentlemen,—In the year 1881 M. Pasteur laid before the members of the International Congress assembled in London an account of recent researches carried on in his laboratory, on the subject of preventive inoculations for chicken cholera and splenic fever. Since that time nearly eight years have elapsed, and we may ask ourselves what has become of the work then begun: has it fulfilled its promise, and what place have the new principles which it involved taken in the science of to-day? It was on these questions that M. Pasteur intended to have spoken to you this afternoon, but the state of his health did not permit of his availing himself of the honour done him by the President and Council of the Royal Society in asking him to give the Croonian lecture this year. He therefore proposed that I should speak in his name, though personally I cannot hope to speak as he would have done of the preventive inoculations which he himself thought out and initiated. My sole title for addressing you is that of my being M.

Pasteur's collaborator, having had, in fact, with Messrs. Chamberland and Thuillier, the honour of being associated with him from the commencement of his researches upon the prevention of contagious diseases, and, further, that I have been an eye-witness of everything which I shall lay before you.

Most infectious diseases never recur, and thus smallpox, measles, and typhoid fever rarely occur more than once in a lifetime. Further, a first attack of an infectious disease, even though a slight one, renders us safe from these diseases for a certain time; and it is this fact, coupled with the non-recurrence of infectious maladies, which has led to the discovery of preventive inoculation.

Instead of waiting till we are struck down unawares by a sudden attack of the malady, frequently during an epidemic of high fatality, and under conditions very unfavorable to our power of resisting it, we now seek to meet it at some favorable moment, and guarded by all those precautions which we know are capable of greatly diminishing the danger. In the place of natural, that is ordinary, infection, unforeseen and over which we have no control, we have now substituted a mode of artificial infection, prepared in such a way as to ensure exemption with as little risk as possible.

It was against smallpox that, for the first time, preventive inoculations were had recourse to. An involuntary experiment, and one, unhappily, too often repeated, had shown that the liquid of the smallpox pustule is virulent, that is to say, that this smallpox lymph, introduced into the body through a wound in the skin, has the power of communicating the disease to a person who has not previously suffered from it. Inoculation with smallpox was therefore easy, all that was required for its production being a prick from a lancet charged with smallpox pus. It was therefore the custom to endeavour to find cases of mild smallpox, from the pustules of which a virus was taken supposed to be non-malignant, but yet capable of subsequently rendering exempt against the virulent disease those who were inoculated by such a mild virus. It is well known to you how widely such inoculations spread, though far from being of an innocent character, for the inoculation which was supposed to give the disease in a mild form often produced it very severely, and sometimes even the inoculation was the cause of death.

How great, therefore, was the progress made by Jenner in replacing inoculation by vaccination, that is to say, in substituting for a severe illness one which is invariably in-

significant, and yet is an efficient protection against infection by smallpox!

Although from the beginning of this century we have enjoyed the inestimable benefit of Jenner's vaccination, we still have not yet completely fathomed its meaning. What is the relation between vaccination and smallpox? Why does the vaccine disease of the horse and the cow, inoculated into man, render him exempt from smallpox? Is the virus of vaccine merely that of smallpox modified, or are vaccine and smallpox two different maladies?

It would have seemed that these questions were easy to resolve, as both smallpox and vaccine admit of experimentation upon them; yet, though always under discussion since Jenner's time, they yet remain without any definite solution having been arrived at. Jenner's great discovery, which seemed to open so wide and hopeful a horizon, has remained hitherto a solitary fact in medicine. Born of a happy observation, marvellously developed by a genius as patient as it was penetrating, it was at the time of its birth so far in advance of the medical science of the time, that even now, after all the progress which has been made during the last seventy or eighty years, we can but suspect its real interpretation. Jenner thus demonstrated to us by one remarkable example that it is possible to protect ourselves from a mortal malady by inoculation with a trivial one; but he gave us no general method leading to the prevention of other infectious diseases.

The discovery of the power of artificially attenuating—that is, weakening—a virus does, on the contrary, furnish us with a veritable method of protective inoculation, and it is one which has given us an uninterrupted series of good results, though this invention dates from but a very few years back. Like all other recent progresses in our knowledge of virulent diseases, it found its origin in M. Pasteur's researches on ferments. In revealing to us the nature of ferments, he taught us that of the poison of infectious diseases. Like the yeast of alcoholic and the yeast of lactic fermentation, viruses are living beings—microbes, as they are now called—and, just as the development of yeast in a sugary liquid produces alcoholic fermentation, so that of microbes in the tissues of the body produces the phenomena of infectious disease. The process which has enabled us to obtain the culture of microbic ferments in a state of purity is the same which has enabled us to obtain pure cultures of microbic virus outside of the body.

The indispensable condition of success in these cultiva-

tions is that of absolute purity—that is to say, the avoidance of the introduction of other foreign germs which everywhere surround us. For this purpose we have now arranged a definite *technique*, strict but at the same time very simple. As the elements of the virus are living beings which can be kept in artificial cultivations, and as they are only distinguished from other lowly organised beings and plants by their property of invading the bodies of men and animals, the question naturally presents itself, Would it not be possible to modify them by cultivation in the same way that other plants are modified? Could they not, for example, be thus robbed of those qualities which make them formidable? To modify a virus by special modes of cultivations—such was the idea of M. Pasteur; a fruitful idea, from which have sprung those discoveries which I now propose to lay before you.

It was in studying a malady called "chicken cholera" that M. Pasteur for the first time obtained by this means an attenuated virus. This disease is so fatal to fowls, pigeons, and birds in general that it has been given the name of cholera. It is caused by the development in the bodies of those attacked of a very small microbe, shaped like a small rod with rounded ends, and almost as wide as long. The photograph projected on the screen shows us the image of a drop of blood taken from a fowl which succumbed to the natural disease. You see between the globules of the blood the little rods which are the cause of the disease. It is, however, not the blood alone in which the microbe is found; all the tissues are invaded by it. The intestines contain a great quantity, so much so that the dejecta of the sick fowls are able to spread the malady, and it is in pecking upon the contaminated ground that healthy birds are infected.

If a minute drop of blood from a fowl which has just died of the malady be introduced under the skin of a healthy fowl, the animal inoculated soon falls ill, ceases to eat, its feathers are erected, its wings hang down, and it seems oppressed with unconquerable somnolence. It soon dies, sometimes in less than twelve hours. The blood of the bird which has thus died from experimental inoculation is found to be swarming with the microbe, exactly like that of the fowls which die after natural infection. It seems, then, that chicken cholera is a contagious disease capable of inoculation, and in which the virus is principally contained in the blood of the animals attacked by it. The culture of the microbe, which is so easily accomplished in the blood of the animals, can also be carried on artificially.

If with proper precautions we inoculate chicken broth, slightly "alkalised" and perfectly limpid, with a drop of the blood, and if we then place the bottle in a stove at 35° C., we shall find after some hours that the broth is turbid, and that this is due to the development of the little chicken-cholera microbe. Under the microscope we shall see that each smallest drop of this *bouillon* contains an innumerable swarm of motionless microbes, like those contained in the blood which served as "seed." An infinitesimally small quantity of this first culture placed in a new bottle will give a second culture, and by successive cultivations as many successive generations of our microbe as we wish for can be obtained. Each drop of these cultures, even up to the twentieth, would kill with all the signs of cholera, quite as surely as the first, any fowl which was inoculated by it. This experiment forms a decisive proof that the virus of the malady is without doubt the microbe found in our cultures, and as we now know how to prepare under absolutely certain conditions as large quantities of the virus as we wish for, we have all the means at hand for the study of this disease.

If we expose at a temperature of 33° C. to the contact of the pure air which penetrates through the cotton-wool stopper of the culture flask one of these cultivations, which is so active that a drop of it would kill any fowl into whom it was inoculated, and if each week we extract a small quantity of the contents of the flask and try its virulence upon healthy fowls, we observe the following changes :— During the first week of the experiment all the fowls inoculated die, but after a longer time a change sets in in the degree of virulence. Not all the fowls now die when a certain quantity of this longer-preserved culture is injected under their skin. Some recover after having been very ill. As time passes the strength of the virus is still more diminished, and the number of fowls which recover increases. At last, in continuing the experiment, the moment comes, say, for example, after it has remained for two months in the incubator, when this virus, at first so deadly, not only will not kill a single fowl, but causes them apparently no inconvenience whatever ; and yet the virus is not dead, for it still grows in fresh nutritive substance in which it may be sown. But in this new culture none of the former virulence returns. The daughter cultures have exactly the same effect upon the fowls as the mother culture had at the time when it furnished the fresh seed. The new property of the virus, therefore, that of harmlessness for those animals for which it was formerly so fatal, can be perpetuated for successive

generations. By making such cultivations we shall obtain at their respective dates a whole series of kinds of virus of diminishing activity capable of giving to the animals either a fatal malady, a dangerous malady, a serious malady, or one wholly inoffensive.

To what cause is this gradual diminution of the malady due? To the continued action of the oxygen of the air. If, instead of making the caltivation in a bottle, where the renewal of the air is possible, we were to make it in a closed tube only containing a small quantity of air, the microbe would soon consume all the oxygen, and would cease to grow, for oxygen is a necessity of its development. In a tube deprived of air it cannot grow; it remains alive in it for a very long time, as one can satisfy oneself by sowing in aerated *bouillon* the small culture formed in these sealed tubes. After being preserved for a year in this sealed tube it still gives cultures which are as active as a recent culture from the blood of a fowl just dead of chicken cholera.

We see, therefore, that the diminution in virulence which takes place in those cultures exposed to the air is dependent on that exposure, and not on the length of time the microbe is kept.

(*To be continued.*)

REPORT ON A PREVALENCE OF DIPHTHERIA AT BURNHAM (ESSEX).

By Arthur Downes, M.D., Local Government Board Inspector; formerly Medical Officer of Health for Chelmsford and Maldon District.

The circumstances here narrated do not present any new or even any unusual feature. They afford, however, a good example of the chronic, or "smouldering," type of epidemic —the most insidious and the most difficult to control.

It may be of interest, too, to note how, long before the presence of the epidemic became generally manifest, it was possible to forewarn the threatened locality. Indeed, it is not improbable that to the consequent carefulness of the chief school authorities is due the absence hitherto of any acute or "explosive" outbreak, such as we so frequently see associated with conditions of school attendance.

Burnham, an Essex coast parish in Maldon Union, has an estimated population of 2500 persons, of whom rather

more than 2000 are congregated in Burnham town. Its staple industries are agriculture and oyster-dredging. There is considerable barge-traffic with the Thames, a little colliery trade with the North, but scarcely any arrivals from "foreign" parts. During the period covered by this report the construction of a new line of railway brought to the place a shifting population of artizans, gangers, and labourers with their families.

The town stands on a bed of gravel sloping southward to the tidal river Crouch. On three sides stretch miles of well-cultivated and breezy marsh-land—marsh in name only. The climate is "bracing," the average rainfall about twenty-one inches annually.

The "Old Town," with the broad High Street running flatly east and west, occupies the lower levels near the river; has a porous soil with abundant but very shallow wells, chief of which is the "town pump." The "New Town," a growth of this generation, stretches over higher ground to the north-west; its gravel is less porous, being largely intermingled with stony loam and clay, and water is not readily found.

The mean annual death-rate of Burnham parish for the past ten years, duly corrected for deaths elsewhere, is 16·0 per 1000 of population. It was unduly raised by an extremely fatal epidemic of scarlet fever in 1879-80, which caused thirty-four deaths. With the exception of a slight and localised outbreak of enteric fever in 1884, caused by emanations from a foul sewer, Burnham has for nine years been remarkably free from zymotic disease. Previously its history had been bad; malaria, indeed, was practically a thing of the past, but "fever" and diarrhœal rates in particular had been very high.

As regards diphtheria, there would seem to have been a severe visitation in 1857-8, when twenty-two persons died of what is termed in the register "ulcerated throat." Thenceforward are only occasional records of sporadic cases, and during the ten years of my office there had been only two deaths from diphtheria in Burnham. These occurred in 1879, and were due to infection from London.

It is notable, indeed, that for ten years no other case of diphtheria had been known to have occurred in Burnham, nor, with the exception of a few cases in an adjoining parish in 1883, had this disease come within seven miles of the place. During this period—a time of most fatal epidemics in the northern portion of the Maldon Union—the whole country, from the Crouch to the Blackwater, has been

marvellously free from diphtheria. In whatever way the *contagium* may be borne, it has not once crossed the mile or two of salt water which lies between the north and south shores of the Blackwater estuary. Diphtheria, then, is apparently not an endemic of the locality.

This brings us down to the present outbreak. I have been reminded by several persons that as far back as the previous Christmas I expressed a fear that we should have an outbreak of diphtheria during the ensuing autumn.

I had during 1887 become aware of the occurrence in Burnham from time to time of sore throats, not coming for the most part under medical observation, but of a sort which a somewhat extensive experience of diphtheria has taught me to regard uneasily. Accordingly I warned the school authorities to use the utmost vigilance in excluding such cases from school attendance.

The throat illness of 1887 had been in families of railway labourers. In January, 1888, two deaths from typical diphtheria occurred in the family of a sub-contractor, and the next-door people became also infected. During the spring much "sore-throat" prevailed in Burnham. On March 7th, I again warned the school and sanitary inspector, and asked the local medical practitioners to favour me with information of any case of diphtheria which might come under observation.

Nothing of note occurred until July, when two cases—one fatal—were reported in a family residing about twenty yards from the January cases. Here again sore-throat appeared in the next-door family, who subsequently, on October 30th, though in another house, lost a child from diphtheria.

No more was heard till October, when four or five cases—two fatal—came under medical treatment; in November occurred six cases with one death, in December three with one death, in January one case fatal, in February two cases and two deaths from "croup."

But, as I said before, there has been all through an unknown but considerable quantity of throat-illness not coming under medical observation; nor do the seven deaths registered as "diphtheria" represent the true mortality from that disease in Burnham since January, 1888, if we include, as doubtless we should, four deaths from "croup," one from "acute laryngitis," and possibly one or two others. A lingering prevalence of diphtheria leaves its mark in many ways on the death-register, and on this I may at some time have more to say.

There is evidence, too, that the groundwork of throat-illness has long since ramified far into the adjoining parishes, and it is probable that with cold wet weather either in the coming spring or autumn we may hear more of diphtheria in the Dengie Hundred.*

As regards the causation of this epidemic the number of cases available for statistical treatment is utterly insufficient to allow of any definite conclusion.

Of twelve families nine resided in New Town, and it may be noted that there is evidence that *cæteris paribus* the newer parts of towns usually suffer most. School attendance played no especial part; in seven of these families the first attack was of a school-going child—no disproportionate incidence when the influence of age predisposition is taken into account.†

With one exception all the houses drained into the public sewers, but so is all Burnham sewered, and in every case the drains were out-door and in good order. The street-vents, which most assuredly would have been accused had they still existed, have long since been replaced by shafts of which no complaint is made. Let me add that throughout the year the sewers have been thoroughly well flushed and looked after.

Public suspicion, which rarely distinguishes *post* from *propter*, had to some extent fallen on the new water supply. This is obtained from a well in drift gravel about half a mile outside the town; the water, which is of good quality on analysis, was first laid on in May, 1887, and is now supplied to all the New Town and probably a fourth part of the Old Town—*i. e.* to more than half the population.

Of the twelve families nine obtained water from the public mains.‡ No useful argument could be based on such data, and I will merely say, first, that water has not yet been proved in any instance to convey diphtheria, and, secondly, that diphtheria, though as yet unrecognised, was already present in Burnham before the new supply was laid on.

Suspicion also fell on a barge of "London manure"—stable refuse and dust-bin sweepings—which was unloaded on October 24th—26th and carted through New Town.

It was alleged (1) that the manure was spread over a

* Since this was written, outbreaks recognised as typical diphtheria have occurred in two of these parishes.

† See *Practitioner*, vols. xxxi and xxxii.

‡ The proportion is now nine out of fifteen families, and the water scare, never of great magnitude, has quite died away.

field in front of a cottage in which a fatal case of diphtheria occurred; (2) that another child, living near the quay where the barge was unloaded, was attacked in consequence of the stink; and (3) that two adults on the route of cartage were attacked on October 25th.

As regards (1) and (2) the one child was already attacked and the other already dead before the stuff came to Burnham; while, of the two adults, the one may equally well have taken the infection from a grandchild who had, I believe, an attack of nasal diphtheria.

The case against the manure, then, rested on no better evidence than the indictment of the water. In every epidemic, however, the inquirer must, if he desires to satisfy public opinion, be prepared to meet and sift all sorts of theories.

To sum up my own opinion, I conclude that diphtheria has been present in Burnham since April, 1887, that it was probably introduced by the railway labourers or their families, and that so far its spread has been apparently simply an affair of chance personal infection. *I should add that the possibility of milk-conveyance of infection was excluded.**—*Practitioner.*

[We give insertion to this valuable and searching report into a serious outbreak of diphtheria in the County of Essex, by Dr. A. Downes, Local Government Inspector. If we rightly remember, Dr. Downes about a year since attributed a similar outbreak near Chelmsford to the use of milk said to be yielded by cows affected with a vesicular eruption in their teats. We would not dispute that the use of the milk might have been the cause of the outbreak; but if so, its contamination did not depend on the state of the cow's teats, but was due to its having come in contact with the germs of diphtheria in some unascertained manner.

In the present report Dr. Downes has taken much broader views, and has given to the profession an exhaustive and most valuable report of his investigations into an outbreak of diphtheria.

There is still much to learn about this and other diseases due to special *contagia*, and we hail with satisfaction that evidence is not wanting of the giving way of the cow-teat eruption theory to one of more common sense and scientific truth.—EDS.].

* These italics are our own.—EDS.

THE SANITARY ADMINISTRATION OF DAIRY FARMS.*

By Shirley F. Murphy, Lecturer on Hygiene and Public Health at St. Mary's Hospital, London.

(*Concluded from p.* 419.)

"The question of ventilation is necessarily considered in connection with that of warming, and the greatest diversity of opinion exists among farmers as to the requirements of the cow in this respect. In some farms in the Midland Counties, the animals are left in the fields night as well as day, winter as well as summer, and are only brought to the sheds for the purpose of being milked. In others, they are in winter housed in open hovels, having but one wall and a roof; in others, again, the hovels are closed in winter with hurdles; and in other farms it is thought necessary to maintain them in an atmosphere of a temperature of 55° to 60° Fahr. It is generally accepted that the quantity of milk is affected by the temperature at which the animal is kept, and that often this is forced with the object of increasing the supply. I believe that the most trustworthy advisers are satisfied with a temperature of about 50°; on this point I may quote the opinion of Mr. George Barham, whose experience is of great value, and who stated at a meeting of the Society of Medical Officers of Health that this temperature is more conducive to the health of the animal.

"Assuming as we may that this is sufficient, we see that it gives scope for the introduction of fresh air even in cold weather without lowering to too great an extent the temperature of the shed, and without resorting to artificial warmth. There is of course need of precise enquiry to show the extent to which the cow vitiates the air she breathes. In the absence of definite knowledge on this subject, it is impossible to do more than judge by the ordinary senses. Experience of this kind shows that permanent openings should be provided on both sides of the shed beneath the eaves, and louvres should be placed in the roof; a constant current would thus be maintained above the animals in a position which would not chill them. Opposite windows in the walls which can be open or shut at pleasure, would enable this air to be supplemented.

"It is somewhat curious that the cow, which in the summer lives in broad daylight in the meadows, is often in the winter confined in a dark shed. Abundance of light is an essential to

* Read before the Epidemiological Society of London on December 14, 1888, and published with the sanction of the Society.

cleanliness, and is doubtless needed in the health interest of the cow herself. There does not appear to be any reason why the house of the bovine should be less well lighted than that of the human animal.

"Before leaving the subject of the cowshed, I may add a few words as to its position and size. I am dwelling to-night especially on country cowsheds, and the demand for air space around them does not therefore present itself as urgent, but it is deserving of note that the Contagious Diseases (Animals) Act gives no control on this point. In large towns, such as the metropolis, the conditions are different, and I may state briefly that the law now permits the occupation of cowsheds so hemmed in with other buildings that ventilation, in the true sense of the word, is an impossibility, and where there can be no proper place for the deposit of the manure which is produced; in London licensing justices should exercise a careful discretion as to the premises which come in this category. In referring to the size of the cowshed, it may be observed there is considerable advantage in limiting the number of cows which can be placed together in the same shed; their subdivisions into smaller groups than are occasionally to be found in some buildings, would tend to lessen the probability of extension of any infectious disease if introduced among them.

"I now come to the question of milk contamination and its prevention, a subject which is of the utmost importance to the public, and which is now engaging the attention of two departments of the State.

"It will be seen that the legislation which at present exists, is based upon the theory that milk infection occurs after the milk has left the cow, and as the result of human agency. The precautions, which can be enforced by law, are such as appear to be reasonable with this view, except that they require amendment in the point indicated. One other difficulty has to be cleared away; the word 'contact' has on one occasion been held to mean actual contact; the instance to which I refer is that of a man and his wife who kept a milk-shop, and who nursed their child suffering from scarlet fever, while the father attended to his own business. The father was constantly with the child, but actual contact with it could not be proved, and the prosecution broke down. The case was not, I believe, heard on appeal; but this point is worth considering when the Order comes to be amended for other reasons.

"But the question seriously arises whether precautions of this kind are enough to protect milk against infection, whether indeed the cow herself can suffer from some malady which may

give rise to milk infection. If I understand aright the position of those who are contesting the conclusions based upon Mr. Power's and Dr. Klein's observations, it is not to deny the possibility of such an occurrence, but to regard the evidence as insufficient to afford material proof, and further, the argument is used, that milk contamination by human agency has not been entirely excluded so as to negative all possibility of such an occurrence having given rise to the circumstances which came before Mr. Power. Upon this point every one must form his own opinion, and I may, without entering upon a discussion of the arguments which have been adduced, limit myself to the statement that at the present time we are without any precise knowledge that milk, which has given rise to infectious disease in man, has ever obtained this power from contact with human contagium. The belief that milk infection has arisen in this way, has been accepted for the reason that, in the absence of other explanation, it coincides with a general sentiment as to the behaviour of contagium.

"If I might mention my own experience on this point, I could tell of a public institution containing wards, some of which contained patients suffering from scarlet fever, and some of which contained patients suffering from other maladies. At one time the milk for the latter was actually carried through the scarlet fever ward in an open can, and even after an alteration in the arrangements of the institution led to the cessation of this practice, the milk for the non-scarlatinal patients was for years daily measured out of a large can by a nurse intimately engaged in the nursing of scarlet fever patients—not one or two, but usually from thirty to forty, and these in all stages of the disease; and yet no evidence is forthcoming that injury resulted from this exposure. This evidence is obviously negative, and as such carries less weight than positive evidence, but the constant repetition of the experiment day by day entitles it to serious consideration. There is, however, one difference between the milk at this institution and that on a farm: the former is always cold, and on the farm, at any rate for some period of time, warm, and it might be pleaded that in this difference rested the freedom from contamination of the milk of the institution. Without admitting the sufficiency of this argument, further evidence may be adduced as to farms, which have undoubtedly had infectious persons resident in the farmhouse the occupants of which have been employed in the cowshed, and yet again without any evidence of influence on the milk. Although not wishing in the state of our present knowledge to give approval to neglect of the precautions which the Order of 1885 prescribes, I am unable, in the light of this experience, to find adequate explanation of the daily infection of

milk in the visits to a farm of a lad dwelling in a house with a case of scarlet fever, but not himself suffering from the disease. This, however, is the only evidence of contamination by human agency which has been put forward in respect of the Hendon outbreak, now the subject of much discussion, and is illustrative of the kind of evidence which has been before regarded as explanatory of similar occurrences.

"Exact medical knowledge, I would venture to say, does not warrant us in attributing milk infection to human agency more than to cow malady, yet the one theory of infection is recognised by the legislature and the other is not. Stringent precautions, I consider, should be taken for the exclusion of both possibilities, and the administration of the dairy farm should be so ordered as to protect the cattle against communicable disease. The dairy farmer can do more than at present is done in regard to this. He should certainly not place among the rest of his herd any newly purchased animal until it has been submitted to a careful quarantine of a month, and his premises should be arranged so as to afford facilities for such isolation. This quarantining should extend not only to the separation of the cattle, but to arrangements being made for the milking of those in quarantine by a person not employed for the milking of the others; and lastly, only after careful inspection should this period of quarantine be declared at an end. Again, if communicable udder disease should appear in any animal in the general sheds, it should be isolated, and the same precautions taken in regard to it as are held to be necessary for animals newly purchased

"By one small detail the dairy farmer can do much to prevent the infection of others of his herd if any one of them should come, in spite of his care, to suffer from communicable udder disease. If the milker would adopt the habit of washing his hands after the milking of each cow, the probabilities of conveyance of infection from one cow to another would be enormously diminished, for there is no doubt that the milker's hands are the usual means by which the infection is carried. In claiming that this rule should be observed on every English dairy farm, I am doing little more than asking that Englishmen should not be less negligent than Danes. In Denmark the rule is to wash after the milking of every two cows, and already, I am glad to say, on some English farms the practice of handwashing after the milking of each cow is adopted. The results, I am told by those farmers who take this precaution, have been entirely satisfactory; and though it has not prevented the occasional appearance of this form of malady on an individual cow, its extension to the rest of the herd has been limited in a marked

degree. The amount of trouble this habit of cleanliness would entail upon the milker would be as nothing compared with the ample return it would make to the farmer in the increased healthiness of his stock.

"For the purposes of legislative control, it may be said that communicable udder disease of the cow, whatever its form, renders her milk unfit for the supply of food for man. On this point, I am able to quote no less an authority than Professor Brown, whose remarks at a recent meeting of the Pathological Society, I would beg to reproduce. Speaking of a disease of this kind which had been prevalent in Wiltshire, he said, 'Whatever the disease really might be, it was at least certain that the milk of cows suffering from it was contaminated with pus and other morbid products, which might very well be responsible for human disease—for infantile diarrhœa, for instance. The condition in which milk sometimes was, might be gathered from a remark made by the dairymen on one farm, which was to the effect that 'they could not drink the milk themselves, and had sent it to London, but they hoped the poor people there would not suffer.' Accepting this conclusion, we may hope to see an Order issued which shall extend to this form of cow malady the same restrictions which are now required in regard to the milk of cows suffering from certain specified diseases. Under these circumstances an outbreak would be notified to the justices, and would be brought under veterinary inspection, and not less important, the milk would not be sold, or used for human food. Professor Brown himself encouraged this hope, and expressed the opinion that it was most necessary to bring the Wiltshire disease under the Contagious Diseases (Animals) Act, and he further said, he had drafted an Order which would have the effect of compelling owners to report the existence of the disease, and would render it possible to isolate the animals. I assume, for practical purposes, he would include, under the word 'disease,' all communicable udder diseases which can affect the milk in the manner he describes; and lastly, I would claim, in view of the possibility of risk to man, that tuberculosis should be dealt with in the same manner.

"As part of the system of cleanliness thought to be necessary for the prevention of the contamination of milk, the maintenance of cleanliness in the cow herself ought not to be omitted. No one who is conversant with English farm life, can fail to be struck with the contrast between the precautions which have been urged as to the exclusion of drain inlets from dairies, and other similar provisions, and the omission to require the least observance of any rule to prevent pollution of the milk by the cow's excrement at the time of milking. The teats and udder

constantly become foulded by the evacuations of the animal, and yet the washings of these parts of the cow is in many instances thought to be a work of supererogation.

"Whether infected milk during the period which elapses between its removal from a farm and its consumption by the milk-drinkers increasingly acquires a power of infectivity is not definitely known, but I have been impressed on more than one occasion with the limited effect such milk has had upon the drinkers resident upon the farm compared with that which it has produced upon those resident in the town to which the milk has been sent. No doubt to obtain accurate information on this point it would be necessary to have very precise information as to the number of persons exposed in both localities, and especially the number who are presumably susceptible to the disease in question. If such increase of infectivity does take place we can well believe that it might find greater opportunity in warm than in cold milk, and on this ground would urge that milk should be cooled immediately after its removal from the cow. The apparatus obtainable for this is effective and inexpensive, but on some farms either the milk is not cooled at all or efforts made in this direction are limited to placing the churn in a pool of water, a very inefficient method of attaining the result desired. The interval which should be required between the calving of the cow and the use of her milk for food is further matter for consideration in discussing the fitness of milk for consumption by human beings. The condition of an animal which has recently given birth to a calf is such that she is specially susceptible to influences which have less effect upon her later. Her milk too is admittedly unfit for use immediately after calving, and sufficient care is not always taken by the farmer to exclude it from the milk churn. Inasmuch as we cannot lay claim to any precise knowledge that would serve as a trustworthy guide on this point, it would probably suffice at the present time to exclude, as unfit for human food, the milk from any cow until a fortnight has elapsed since the birth of the calf.

"Regulations made under an Act of Parliament or Order in Council have been permitted to extend to small details of domestic life; as illustration, I may refer to the Model Regulations of the Local Government Board for houses in the metropolis let in lodgings. Where a local authority is judicious in the exercise of these powers, hardship is not inflicted, but the regulations are used more for the purposes of education than for prosecution, and the latter is reserved for cases of flagrant disobedience. I believe, therefore, that the regulation of dairy farm administration, in the sense I have indicated, is necessary and proper; it need entail no unnecessary hardship on the

farmer, and it is certainly urgently required in the interest of the milk drinker.

"If we think of sanitary administration as extending beyond the circumstances I have narrated, it might include some control over the proceedings of a milk farm, the milk of which was alleged to cause disease in man.

"In the public interest, it would be right that a local authority should have the same power to prevent the sale of milk suspected of communicating a dangerous infectious disorder that it has to prevent the continued attendance at a school believed to be spreading diseases of this kind, and moreover, with a view to enabling the authority to obtain information, it would be right that it should be permitted to know the addresses of persons to whom the milk of a particular farm was supplied. The remedy against injury to the interests of the milk vendor could be found in a system of notification of infectious diseases, such notification rendering unnecessary application at particular houses for information.

"One other point of control that should be exercised is that which would prevent the removal from the farm of any cow of a herd the milk of which is suspected to be infectious. Experience has shown this to be necessary, and the interests of other cowkeepers, who might unwittingly purchase such animals, should be protected as well as that of the milk drinkers. Doubtless such restrictions would be accompanied by proper precautions against an unjust or unnecessary use of these powers.

"What is immediately wanted is that the legislation, which is now limited in its application to the cow in her shed, should be extended to cover all the circumstances of her life, whether in the shed or in the meadow, and that her personal cleanliness should be provided for as not less important than that of her house, and further, that some effort should be made to give effect to the provisions of the law. For it is no exaggeration to say that the only sanitary administration in many districts in respect of dairy farms at the present time, which is worth the name, is that which has been created at the instance of certain milk vendors in large towns who have been desirous of protecting the customers they supply.

"Again, the recognition that other diseases than those specified under the Act of Parliament have effect upon the milk, is a step which would bring upon the scene the veterinary inspector, whose active co-operation is urgently needed for the prevention of disease in man."

PLEURO-PNEUMONIA IN QUEENSLAND.

(*Concluded from* p. 426.)

An ox of three years old, very thin, inoculated later on with the lymph of a calf which had died after inoculation with virus kept for a month, became very ill, developed a large œdema, and also recovered.

So that out of ten animals inoculated with fresh virus, or virus kept for only a very few days, we had six cases of death; two cases with very considerable œdema, which could have been utilised had the calves been killed at the time when the disease was in full evolution and the temperature was between 105° and 106° Fahr. In two cases the œdema could only be utilised for a restricted number of inoculations.

With the virus which we collected at Monsildale we inoculated nine animals of different ages, from one year to three years. Four only died. Two calves of one year old had a very large œdema, but recovered; one heifer of three years old developed a very limited œdema; the two others showed a larger œdema, but they also recovered.

To what must this difference in the result be attributed? Why did the virus collected at Monsildale prove itself less active than that collected at Tabragalba? In the case of the ox killed at Tabragalba, the disease was in full evolution, while in that of the ox killed at Monsildale the animal had been ill for a long time—was perhaps on the way to recovery; and stock-owners have long known that the best virus is that obtained from an animal which has not passed the second stage of the disease.

It is, therefore, probable that lymph taken from an animal at the different stages of the disease does not always possess the same virulence, and fresh experiments will perhaps show that the maximum of virulence is reached at the moment when the œdema continues to enlarge and the temperature varies between 105° and 107° Fahr. We think that at this moment a calf possessing an œdema of large enough extent to satisfy practical wants can with all security be killed.

But after all, it is not necessary to give too much attention to this difficulty, for if there is a large mob of cattle to inoculate it will be safer to inoculate two or three calves, and there will be at least one case of death with the requisite quantity of lymph.

(b) Does the subcutaneous liquid, when inoculated in the tail, protect animals against a second attack of the disease in the same degree as the virus taken from the lung or from the pleura in a spontaneous case?

Willems, a Belgian surgeou, was the first to affirm that animals inoculated in the tail with the virus of pleuro-pneumonia are refractory to a second attack of the disease, and "brave epizootic influences with impunity." What is the proof of this assertion? If the manner of contagion of the disease were

known, and if there were a certain means of communicating it, with its ordinary anatomo-pathological characteristics, this proof would be easily given; it would be sufficient to protect the animals and to show that they are refractory to the disease, while other unprotected animals do not resist it. But if this proof be wanting, we have on one hand the results of the practical experience of stock-owners, and in Queensland there is such a conviction as to the efficacy of the Willem's method, that we will insist no longer on this point. We have, on the other hand, the fact that animals which have been inoculated in the tail resist a second inoculation in a "forbidden part." We have just seen that if inoculation is performed in the neck or behind the shoulder of a "new" animal (one which has never had the disease, or which has never previously been inoculated) an œdema is caused which generally proves fatal. This inoculation produces, on the contrary, no effect if it has been preceded by an inoculation in the tail. This is a scientific fact which has been known for a long time, and it will suffice to read the articles of Professor Bouley (*Recueil de Médecine de Vétérinaire*) to be convinced of its truth.

What we have to do is to prove that the lymph collected in the subcutaneous œdema possesses equally the same protective qualities as does lymph collected in the lung or in the pleura.

With this end in view we made the following experiments:

We inoculated in the tail with subcutaneous lymph, three heifers of one to two years old, and two bulls of one year old.

Two other heifers which were to serve as a term of comparison were also inoculated in the tail, but with natural virus collected at Warwick.

The animals inoculated with subcutaneous lymph underwent no perceptible inconvenience, only a very light swelling on the tail, exactly limited to the point of inoculation, appearing four or five days after the operation, and not lasting more than seven or eight days. The swelling was accompanied by light feverish symptoms, the temperature not rising above 104·6° Fahr.

One of the heifers inoculated with the Warwick virus was affected in exactly the same manner, but in the case of the other one the swelling on the tail rose $1\frac{1}{2}$ ft. above the point of inoculation. Inoculation had been tried on this heifer with a slender glass tube, instead of using the syringe with which the others were operated on, so that a small bleeding wound had been made, and the bones more or less touched during the small operation. But the temperature followed exactly the same course as in the other cases.

We had now to submit these animals to the test of a second inoculation, made this time in a "forbidden region." After an interval varying from six weeks to two months, these seven calves were, therefore, inoculated afresh behind the shoulder, with about two centimetres of virus (about thirty-two drops), collected at Monsildale from an ox suffering from pleuro-pneumonia at the period of grey hepatisation.

The same day, with the same virus, and with the same quantity thereof, a second lot of nine animals was inoculated for the first time, behind the shoulder.

Another lot of four calves, which had been used for previous experiments with the subcutaneous virus, and which, as we said above, had resisted an inoculation on a level with the thoracic walls, were also inoculated on the same day and with the same dose, with virus collected at Monsildale. So that we had on the one hand eleven animals protected, and on the other nine unprotected.

The result of this experiment was as follows:

Among the protected animals two had a very slight œdema at the point of inoculation, *and none died;* while of the nine unprotected ones four died with the ordinary œdema, four had an extensive œdema and recovered, one heifer of three years old had only a very limited and transitory œdema.

The conclusion to be drawn from this experiment is a dual one. It shows first of all that subcutaneous virus and natural virus collected in a spontaneous case of pleuro-pneumonia have the same effect, and that their use is optional for protective inoculations in the tail. But this experiment shows us, moreover, that the protection is incontestable; it gives a new scientific confirmation to the data furnished by observation and by practical experience. Stock-owners have noticed that animals inoculated in the tail can, as Willems says, "brave epizootic influences with impunity." We have proved once more that animals so inoculated could resist an inoculation which kills four ninths of unprotected animals.

There is no doubt that the demonstration would have been still more conclusive if we had been able to procure a more active virus than that we collected at Monsildale, but it is sufficient as it stands.

We now find ourselves in possession of two leading facts:—
1. By inoculation in a forbidden part of a young calf of from six months to one year old, a sufficient quantity of lymph can be obtained to inoculate from 1000 to 1500 head of cattle, at least.
2. This lymph protects animals inoculated in the tail by the ordinary method, against a fresh attack of the disease.

If, moreover, it be possible to preserve this lymph in a virulent state for a long enough period, it will be understood that any stock-owner in the colony will be able for the future to procure the necessary virus to protect his animals.

Many processes have been suggested for the preservation of pleuro-pneumonia virus. It has been proposed, for example, to mix it with glycerine or with different antiseptics; efforts have been made to desiccate it, &c. As these processes are known by everybody we will follow them no further; it is generally recognised that they are very uncertain, more often illusory, and sometimes even dangerous.

M. Pasteur's researches have taught us that the most corrup-

tible organic matters—blood, urine, animal or vegetable infusions—could be preserved indefinitely without undergoing any putrefaction if precautions were taken to keep them sheltered from outside germs. By the same method M. Pasteur, and after him all the bacteriologists, have shown that the virus of various infectious diseases could be kept in a state of purity and with all their activity. Thus, to cite only one example, drops of anthracitic (charbonneux) blood can be kept for weeks and months without losing their first virulence.

Is it the same as regards the virus of pleuro-pneumonia?

This we have endeavoured to decide; but during the short space of time which our researches have lasted, we have not been able to thoroughly sift the question, and many unknown facts remain to be elucidated. Besides, animated as we were by the desire to arrive at a practical solution, accessible to everybody, we have endeavoured to render it as simple as possible.

We therefore collected, in a pure state, some samples of subcutaneous lymph in slender tubes which had previously been sterilised. Some of these tubes were placed in an ice-chest, while the others remained exposed to the ordinary temperature of the laboratory.

Our experiments were made with lymph seventeen days old, and with lymph preserved during one month.

(A) With the seventeen days' old lymph kept at the ordinary temperature of the laboratory, we inoculated two calves, of about one year old, behind the shoulder. One of them died with an enormous œdema, and the *post-mortem* examination made in the presence of Messrs. Gordon and Bruce showed that there was enough lymph to inoculate from 1500 to 2000 head of cattle. The other developed just as large as an œdema, but after a long illness ended by recovering.

(B) With lymph kept during a month seven calves were inoculated behind the shoulder. Only one of these calves died with the ordinary large œdema (this one was inoculated with lymph preserved at the ordinary temperature). Two others had an œdema of considerable size (these were inoculated with lymph kept in an ice-chest) but survived. Four showed neither œdema nor rise of temperature. Although the doses of virus injected were comparatively weak (two or three drops), it appears from this last experiment that the virus has lost a large portion of its virulence at the end of a month. After fifteen or twenty days, on the contrary, it would appear to retain its primitive virulence.

It now remains for us to show what practical benefits can be derived from the knowledge of the facts which we have just set forth.

Let us suppose that in Brisbane, or in any other central place, a station is established where every fortnight two or three calves are inoculated either with virus collected from a case of spontaneous pleuro-pneumonia, which must be done from

time to time to *rejuvenate* the virus, or with subcutaneous virus taken from calves previously inoculated. Enough tubes of virus could be collected in a pure state to provide for all demands; these tubes it will be possible to send by post. With the virus thus obtained, stock-owners can sacrifice two or three calves, which would furnish the amount of lymph necessary for inoculations. Instead of having recourse to a central station, stock-owners could, if they preferred, collect a few tubes of virus from an animal killed on their runs, and send it to a distant station where no case of pleuro-pneumonia existed, but where it was desired to inoculate a mob before making them travel. All that is required is a few sterilised tubes, a spirit lamp, and a small forceps.

To enable everyone to proceed with certainty, we believe a few indications as to the means of collecting virus, and afterwards inoculating it, would be useful.

(A) If it is a case of spontaneous pleuro-pneumonia the diseased lung should be uncovered, care being taken not to injure it with the instruments or with the hands, and the surface of the lung on a level with the point where it is desired to make the collection of virus should be burnt with a rod of heated glass. Having broken the point of a slender tube, the latter should be passed in the flame so to destroy any germs which might exist on the outside surface of that part of the tube which is to penetrate the lung. When the tube has been pressed in, some drops of the lymph should be inhaled by slightly sucking, and the slender end of the tube should then be closed with the lamp. The virus keeps equally well if the two extremities of the tube are sealed at the flame, and under these conditions it is much easier to carry. If it is desired to collect the lymph which is often contained in large quantities in the pleura it will be necessary to first expose the ribs, being very careful not to open the thoracic cavity. The side on which the pleuritic discharge is situated can be ascertained by sounding (percussion). The liquid is often contained in partitions formed of false membranes, but is always sure to be found after a few trials by sinking tubes in different parts of the chest. If tubes with large receivers are available it will sometimes be possible to collect several pints of virus, and to make use of it, after a lapse of a fortnight or three weeks, for inoculations in the tail.

As regards subcutaneous virus, it will be necessary first of all to break, by a smart stroke delivered with an ordinary hammer, for example, the meshes of the connective tissues in which the lymph is imprisoned. This simple act (*tour de main*) facilitates in a singular manner the collection of the virus, and has, moreover, the advantage of mixing the lymph with solid particles. Before sinking in the slender end of the tube, the hair and skin must be deeply burnt in order to destroy the germs existing on the surface.

The virus which it is desired to keep *should be placed in the*

dark, and above all things, exposing it to the direct rays of the sun should be avoided.

The animals which are destined to furnish the virus should be inoculated in the neck or behind the shoulder, behind the shoulder in preference. It will be sufficient to break the point of the tube and to sink it under the skin by a slight twisting movement—the point would break if it were attempted to press it straight in. It would perhaps be preferable to use a hypodermic syringe, which would make the operation easier, more especially if the animals are difficult to keep still.

When lymph is being collected from an animal which has just succumbed, or which has been slaughtered, it is transparent and limpid, and only appears to contain a few very small granules. But after a short time the fibrine coagulates, and a cloud composed of the fibrine forms rapidly and unites all the solid particles contained in the liquid together. We believe it necessary to inoculate some of this solid matter, which appears to contain active parts of the virus.

About a cubic centimetre (sixteen drops) of virus should be inoculated.

The death of the animals inoculated should be awaited, but they may be slaughtered in full evolution of the disease when the œdema appears sufficiently large for practical requirements.

The body resting on the healthy side, a wide incision should be made extending from the haunch to the shoulder, and the skin should then be raised in such a way as to form a pocket, in which the liquid will collect naturally and where it can be easily taken. As the lymph is contained in the meshes of the connective tissue it will be necessary to lacerate this tissue with a knife and to expel the liquid therefrom with the hands. Of course the greatest precautious as to cleanliness are necessary.

In compliance with the desire of the Queensland Government we have, while carrying out the above experiments, endeavoured to isolate the pleuro-pneumonia microbe—if such a thing exists. In no instance have we been able to obtain a "culture" by trying in various mediums lymph collected either from the subcutaneous œdema or from the pleuritic serosity, which, however, at least proved the purity of the lymph which we employed. In four cases, by placing some blood taken direct from the heart in some ordinary beef broth, we were able to cultivate a microbe, which when inoculated into two heifers produced each time a swelling which remained localised. We have not yet been able to satisfy ourselves as to the specification of this swelling.

Before leaving the colony in which we have received such a friendly welcome, we desire to thank the members of the board, who have always given us such obliging assistance. We also wish to thank Mr. Henry W. Beck for the vigilant care he has taken of the animals under experiment.

(Signed) Dr. Germont.
Ad. Loir.

ANNUAL REPORT OF THE AGRICULTURAL DEPARTMENT.

We quote the following from the report:

"No serious outbreak of any of the animal plagues which come within the provisions of the Contagious Diseases (Animals) Acts occurred in the past year. Pleuro-pneumonia was prevalent in some districts, and swine-fever was generally rife. Outbreaks of anthrax and rabies were not so frequent as in the previous year. In regard to rabies it may be said that its area was so limited and so well defined that the disease might have been extinguished by the adoption of proper restrictions, but it unfortunately happens that when the area in which a disease exists is reduced to comparatively insignificant dimensions any attempt to enforce severe measures for the purpose of securing its complete extinction is always objected to as uncalled for.

"In addition to the ordinary work of the Department important investigations were carried on during the year 1888 in reference to the origin, nature, and means of prevention of certain diseases which affect the live stock of the farm. The results which were obtained, although not in all cases conclusive, added some valuable facts to our knowledge of the maladies under consideration and indicated the direction in which further inquiries may be prosecuted.

"The diseases which were the special subjects of scientific research were tuberculosis, and actinomycosis, an affection known as wens or clyers, which is commonly considered to be a symptom of tuberculosis; swine fever, anthrax in swine, and the disease of the udders and teats of cows usually called cow-pox. These affections are all well known to stock-owners at least so far as their ordinary characters are concerned, but there are many points connected with their pathology, their alleged relation to each other, and to diseases of the human subject which require elucidation.

"On the subject of the so-called Hendon cow disease a special report was issued by the Agricultural Department in the summer of last year containing the results of the inquiry which has been conducted by medical and veterinary experts in different parts of the country.

"The object of the investigation was chiefly to ascertain

whether there existed among cows any eruptive disease which was capable of producing scarlet fever in the consumers of milk from the diseased animals.

"If such a disease did exist it could hardly fail to be detected, and under this conviction the inquiry was commenced.

"The first fact which was clearly established was in itself sufficient to throw doubt on the conclusion which had been arrived at as to the relation of the Hendon cow disease to scarlet fever of man. The Hendon disease was introduced into the Hendon dairy farm by cows from a lot purchased by Mr. Keevil in the Derby market; from the same lot, cows were sent by the dealer to his brother's farm, and also to other dairy farmers, and in all of them the disease spread to the cows on the farms as it did in the Hendon dairy, but no outbreak of scarlet fever occurred among the consumers of the milk from these other dairies.

"In the course of the inquires hundreds of cases of udder disease, identical in general and microscopic characters with the Hendon disease, as it was described by the experts who investigated it, came under observation, but in no case was scarlet fever coincident with the distribution of the milk. In fine no evidence was obtained to lead to a suspicion that the milk of cows suffering from any form of udder disease could cause scarlet fever in man independently of a human source of infection.

"Since the report was laid before Parliament outbreaks of udder disease of a contagious character have been frequently reported. In fact, such affections are most common among dairy stock. But in no instance has it been found that the milk of the diseased cows has induced scarlet fever.

"The Hendon outbreak, if the account which has been given of its character and consequences be accepted, stands alone in the history of cow diseases. Nearly four years have elapsed since the event transpired, and dairy farmers have ceased to disquiet themselves with fears which at the time caused something like a panic among them. In the course of the observations and experiments which were carried on in 1887–8 it was demonstrated that milk contaminated with discharges from teat ulcers caused similar ulcers in the lips and in the mouths of calves, with other forms of disturbance as diarrhœa. It was remarkable that these effects should follow the consumption of food charged with morbid products, and the fact is quite sufficient to indicate the importance of dealing with udder diseases if cows are to be considered under another aspect than that

of their alleged relation to specific fevers of the human subject. There can be no doubt of the fact that, among udder diseases, the one which is now, and always has been, recognised by veterinary surgeons and dairymen as cow-pox, is spread rapidly from cow to cow by the agency of the milker's hands; that the teats soon become covered with discharging sores, which cause the animal intense suffering during the process of milking, while the discharges contaminate the milk. It was proved that the progress of the disease in a herd of cows can be checked by the use of perfectly simple precautions, and in these circumstances it appears to be desirable that cow-pox should be included in the definition of disease within the meaning of the Contagious Diseases (Animals) Acts for the purposes of certain sections of those Acts, *i. e.* to provide for notice being given of the existence of disease, and to prevent extension, and the isolation of diseased cows.

"*Pleuro-pneumonia.*—In the first quarter of 1888 an Order of Council was passed, to come into effect on March 10th, rendering it compulsory on Local Authorities to slaughter all cattle which had been in the same shed, field, stable, or other place, or otherwise in contact with cattle affected with pleuro-pneumonia, or had been in any manner exposed to the infection thereof.

"This Order was passed in accordance with the urgent representations of the Royal Agricultural Society and other societies, but soon afterwards a deputation from the Highland and Agricultural Society of Scotland waited on the Lord President and the Chancellor of the Duchy of Lancaster, to represent that signal success had attended the inoculation of cattle which had been exposed to the infection of pleuro-pneumonia, and that it was desirable that a series of experiments should be carried out, under the direction of the Agricultural Department, to test the value of the operation. Subsequently a deputation of the London dairymen attended, and protested against slaughter, on the plea that such a mode of dealing with the disease would ruin their trade, and prove more disastrous than the ravages of the malady. Finally the whole subject was refered to a departmental committee, who were also instructed to inquire into and report on the disease known as tuberculosis, and advise as to the best means of prevention.

"*Tuberculosis.*—This disease has long been recognised in cattle as the affection which in its main features corresponds to consumption in man. Among domesticated animals, sheep and swine, the latter especially, are liable to the

affection, and it is also prevalent in poultry and rabbits. No direct evidence exists of the transmission of tuberculosis from the lower animals to man; and owing to certain structural differences in the diseased organs, some observers have doubted the identity of the disease in man and animals. On this point it may be remarked that recent experiments conducted by Dr. Crookshank by direction of the Agricultural Department have proved that inoculation with sputum of consumptive patients causes the development of tuberculosis in the most pronounced form in the calf. The communicability of the bovine disease to man cannot be asserted on experimental evidence, but it is at least a fair conclusion that the disease in man and bovines is intercommunicable.

"In the Harveian oration delivered before the Royal College of Physicians by Dr. Latham it was stated that consumption had decreased to the extent of 28 per cent. in the last quarter of a century. There is a general belief that bovine tuberculosis has increased year by year. No statistics, however, exist bearing on the point, and it must be allowed that the statement is unsupported by facts. More attention has been attracted to the disease in recent years, and numerous cases have been detected and reported which would formerly have escaped notice.

"*Swine Fever.*—Experiments were carried on during the last year with the view to determine whether any form of attenuated virus could be applied to render the system of the pig proof against the disease.

"*Feeding Experiments.*—Swine were fed with morbid products obtained from lungs, spleen, and intestines of others which had died of swine fever. The matter was diluted with various proportions of sterilised broth and then mixed with the food, but in all cases the animals so treated took the disease and died or were killed.

"Feeding with pure cultivation of the organism, which is the reported cause of swine fever, produced no effect, and did not protect the swine from the disease when they were subsequently exposed to infection by being put into a swine-fever infected pen.

"Further experiments are being carried into effect with the view of determining whether any one of the several organisms which can be isolated from the diseased organs in swine-fever will produce the disease in swine, and until that point is decided it is not likely that any benefit will be derived from inoculation. Under any circumstances a serious obstacle opposes itself to any system of preventive inoculation

in swine fever so far as this country is concerned, *i. e.* the impossibility of applying the remedy until after the disease has appeared and a certain proportion of the animals have become infected.

"In swine fever as in pleuro-pneumonia the disease often exists in a form which is not indicated by any marked symptoms, and in both diseases animals which are affected may be moved about without attracting attention. Such animals distribute the infection wherever they go. There is no evidence that inoculation will render a diseased animal harmless to others with which it may come in contact. To make inoculation compulsory in its application to all the swine in the country might to some extent obviate this objection, but the proposition is one which no one has yet made seriously, and if made could not be entertained.

"Reference to previous reports will show that swine fever has been dealt with by Orders of Council at various times as far as the powers of the Privy Council extend. But the carrying into effect of the Orders is imposed upon Local Authorities who hold diverse views as to the manner of executing the duties which devolve on them, and are by no means agreed as to the necessity for the adoption of stringent measures in swine fever.

"Another important point is that common ailments of pigs, indigestion from eating salted food, congestion of lungs, valvular disease of the heart, extremely common in swine, and other non-infectious complaints are attended with symptoms which may be mistaken for swine fever.

"During the last year a large number of specimens taken from swine which had been slaughtered for swine fever were examined by the veterinary officers of the Agricultural Department. In many of the specimens forwarded no indications of swine fever were detected. A large proportion of the remainder exhibited only doubtful signs of the disease. In other cases the appearances were sufficiently defined to justify a positive opinion as to the nature of the disease.

"If all Local Authorities were agreed as to the importance of stamping out swine fever it would not be an easy work judging from the experience of other countries, but it is quite certain that there are very few Local Authorities who are disposed to adopt severe measures, and while this attitude is maintained there is little hope that the disease will be got rid of.

"It has been stated repeatedly in the reports of the Agricultural Department, that swine fever is, in its virulence, on a par with cattle plague, and its extermination is only

possible under a system of cattle-plague restrictions, which could not be effectually enforced under existing circumstances.

"*Anthrax.*—A considerable decrease in the number of outbreaks of anthrax was observed in 1887, as will appear on reference to the report of the chief inspector and the assistant inspector. Anthrax in swine was the subject of special investigation during the past year. It constantly happens that swine are fed on the offal of animals which die from various diseases, and it has repeatedly occurred that carcases or portions of carcases of animals dead of anthrax have been so disposed of. Hitherto it has been held that, while swine undoubtedly die after eating offal of such animals, they are not susceptible to anthrax, and that the bacillus of that disease does not reappear in the blood and tissues of the pig inoculated with anthrax virus. As swine were frequently returned by inspectors as having died of anthrax, it was important that the question should be decided if possible, and accordingly Professor Crookshank was requested to make an experimental inquiry, and after repeated attempts he succeeded in infecting swine with true anthrax. Dr. Crookshank's report on the subject is highly interesting, and may be said to have set at rest the doubt which existed as to the liability of swine to suffer from the disease. At the same time his observations prove that the anthrax organism does not grow readily in the pig.

"No attempt has been made in this country to deal with anthrax by preventive inoculation with cultivated virus on the system adopted by M. Pasteur with considerable success in parts of France, New South Wales, and other countries in which the disease has a constant existence. Anthrax, in the United Kingdom, only occurs at irregular periods, and does not extend from a centre like other contagious diseases. In many outbreaks the majority of the animals in a herd or flock escape, while in other cases the affection proceeds rapidly and destroys a large number of animals so quickly that no opportunity is afforded for the trial of preventive measures. If protective inoculation is to be fairly tested it must be adopted symmetrically before an outbreak occurs, and such a system cannot be advocated in this country, where the affection only appears from time to time.

"*Rabies.*—Comparatively few cases of rabies were reported in the course of the year among dogs, and as a natural consequence no extensive outbreaks of the affection were observed among cattle and sheep.

"It is worthy of notice that rabies was practically limited

to two areas in the country,—one in which it is habitually existent, a district including the counties of Lancashire, Cheshire, Staffordshire, Derbyshire, and York (West Riding); the other comprising counties which are close to the metropolis, and including the metropolis, Middlesex, Essex, Surrey, Sussex, and Kent.

"The total cases of rabies were 176; of these, 166 were divided between the two areas named. That the disease might have been extirpated in the two groups of counties to which it was confined is hardly a matter of doubt, but without the alarm engendered by an extensive outbreak no restriction on the movement of dogs can be maintained, and we shall doubtless continue to repeat the system of checking the affection and allowing it to spread again as soon as the excitement is allayed. A repetition of the repressive measures is likely to be required soon, as rabies is steadily spreading in the metropolis and its vicinity in the absence of any regulations."

ROYAL VETERINARY COLLEGE.

July, 1889.

Fourteenth Annual Report under the Charter of Incorporation ordered by the Governors of the College to be presented to the Subscribers.

General Government.

Since the last annual meeting a vacancy has occurred in the list of Vice-Presidents of the College, caused by the death of the late Viscount Portman, who was elected a subscriber in 1829.

At the annual meeting in July, 1888, the Duke of Portland and Lord Fortescue were elected Vice-Presidents of the College, and Lord Aveland, Lord Ebrington, and Mr., now Sir Jacob, Wilson, were elected Governors.

There are consequently eleven Vice-Presidents and twenty-seven Governors on the list. The full complement under the Original and Supplemental Charters being twelve Vice-Presidents and thirty Governors, there is, therefore, at present one vacancy in the former and three in the latter office, which may be filled up at the approaching annual general meeting.

The School.

Of the 64 students who have entered the College, 38 did so by Matriculation and 26 by Certificate of Educational Fitness.

While the attendance and behaviour of the students during the year has been generally satisfactory, it has been deemed expedient to suspend a certain number, either for irregular attendance or for other reasons, a proceeding which has had a most salutary effect, and which it is hoped will entirely suppress a class of students hitherto, unfortunately, somewhat numerous, and generally known as " chronic."

The number of names at present on the books is 226, as against 291 last year, showing a decrease of 65. Of these students 48 are in Class A, 101 in Class B, and 77 in Class C.

From July, 1888, to July, 1889, 54 students have obtained the Diploma of the Royal College of Veterinary Surgeons, the number last year being 61, and the previous year 42.

During the past year the Governors regret to report the loss by death of the Senior Member of the Educational Staff, viz. Professor Tuson, who had held the Professorship of Chemistry for twenty-eight years. The duties of the office have, since Professor Tuson's death in November last, been satisfactorily performed by Mr. Jas. Bayne, F.C.S., an old assistant of Professor Tuson's.

Infirmary and Subscribers.

The daily average of horses in the Infirmary during the past year has been 55, showing an increase of 8 since 1888, when the number was 47 ; in 1887 the number was 53.

The average number of dogs has been 10 against 9 last year.

The individual number of cases admitted into the Infirmary for treatment or special examination has been 905, against 861 last year, and 878 the year before.

The number of horses examined for soundness has been 1276, the number during the previous twelve months being 1202, and for 1887 1131.

The number of animals treated as out-patients has been 1636, against 1590 last year, and 1644 the year before.

187 new subscribers have been enrolled during the year, of whom 17 are members of the medical profession, and 2 of the Royal Agricultural Society, who have availed themselves of the privilege, granted by the Governors in March last, of becoming subscribers at a reduced subscription of one guinea.

There are present 107 life and 839 anuual subscribers.

Gratuitous Advice.

This department continues in active operation, and its advantages are highly appreciated by the senior students, by whom, under the supervision of an officer of the College, it is carried on.

During the year 1775 individual cases have been brought for advice or treatment, and as several of these pay more than one visit the total number of inspections which have taken place

amounts to 2425. The numbers last year were 1618 and 2555 respectively.

Buildings.

During the past year the various buildings have been maintained in a state of thorough repair. A new Bacteriological Laboratory has been fitted up, and the seats at the end of the long class-room raised.

Finance.

The Governors are pleased to report an excess of income over expenditure amounting to £934 16*s.* 6*d.*

The total income for the year has been £10,494 10*s.* 2*d.*, and the expenditure 9559 13*s.* 8*d.*; last year the income was £9827 13*s.* 1*d.*, and the expenditure £9806 3*s.* 2*d.*

The income from the stable department shows an increase of £468, and from the general department of £200. The expenditure in the stable department has increased by £249, but has decreased in the general department by £497. The increased expenditure in the stable department is principally due to the larger number of horses and other animals left for treatment, and the decrease in the general department to the smaller amount paid in salaries to the professors and officers of the College.

Royal Agricultural Society.

In response to a notice inserted by the Principal in the journal of the Society, a large number of cattle, sheep, and pigs have been forwarded to the College during the past year for treatment or inspection, and the expenses of their keep, &c., defrayed from the annual grant of £200 made to the College by the Council of the Society for purposes of this nature.

Some important investigations respecting outbreaks of disease have been undertaken by the College on behalf of members of the Society, especially in relation to a fatal form of disease of the udder among breeding ewes, and also to a very prevalent disease among cattle known as "Actinomycosis." Outbreaks of anthrax and parasitic disease have also been investigated.

The Governors are pleased to report that their relations with the Society continue of a most friendly nature.

Scholarship and Coleman Prizes.

The Principal and Professors recommend that the Scholarship be awarded to Mr. J. W. Reynolds; the Coleman Silver Medal to Mr. W. A. Byrne; the Bronze Medal to Mr. J. Beanland; and the Certificate of Merit to Mr. A. Le Sueur.

July 8th, 1889.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD JULY 1st, 1889.

Professor J. W. Axe, President, in the chair.

The *Secretary* read the notice convening the meeting.

Present:—Sir Frederick Fitzwygram, Professors Williams, Brown, Walley, Duguid, Pritchard; Messrs. J. D. Barford, E. C. Dray, H. Kidd, W. Wilson, Wragg, Woods, J. F. Simpson, T. Greaves, W. Whittle, W. Hunting, J. Roalfe Cox, J. D. Lambert, T. Briggs, W. F. Mulvey; Mr. G. Thatcher, Solicitor; and Mr. A. W. Hill, Secretary.

The minutes of the previous meeting were taken as read and confirmed.

The *Secretary* announced that letters expressing regret at inability to attend had been received from Dr. George Fleming, Professor McCall, Sir Henry Simpson, and Messrs. Taylor and Perrins.

The *Secretary* announced that the following presentations had been made to the library:—Work on "The Tropical Diseases of the Horse," by William Burke, Army Veterinary Department; and "The Annual Statistical and General Report of the Army Veterinary Department," by Dr. George Fleming.

Mr. Dray proposed a vote of thanks to Dr. Fleming and Mr Burke.

Mr. Woods seconded the motion, which was unanimously agreed to.

The *Secretary* read a letter from Dr. McBride with regard to an application on behalf of his brother, who has gone abroad, for a certificate in lieu of lost diploma.

Mr. J. F. Simpson thought that the Council should not merely accept the written statement of a gentleman to the effect that he had lost his diploma. Dr. McBride should pursue the ordinary course of making a proper declaration before a Commissioner or a magistrate before the Council could think of entertaining his proposal.

The letter was ordered to be laid upon the table.

Report of Finance Committee.

Mr. Dray proposed that the report of the Finance Committee should be taken as read, and that the Council should sanction the drawing of cheques to meet the liabilities of the current year.

Professor Walley seconded the motion, which was agreed to.

Report of Registration Committee.

On this report and the recommendations contained therein

coming up for discussion, it was discovered that a quorum of members was not present to deal with the case of Charles Lawrence, so the matter stood over until a quorum could be obtained.

Professor Walley proposed the adoption of the report of the Registration Committee, with the exception of the recommendation with regard to the case of Charles Lawrence.

Report of General Purposes Committee.

Mr. Wragg moved the adoption of the report.

Professor Walley seconded the motion.

Mr. Greaves inquired whether the Secretary had received any communication from Mr. Carlisle with reference to his portrait.

The *Secretary* said that no communication had been received.

Mr. Greaves suggested that the portrait of Mr. Carlisle should be received and hung in the Library.

Mr. Hunting was of opinion that it would be a more graceful act on the part of the Council to let the matter stand as it was. It would be an extremely ungraceful thing on the part of the Council to tack any rider on to the resolution of the Committee.

Mr. Simpson said he had had an interview with the donors of the portrait, and he had ascertained that it would be quite in accordance with their wishes that the matter should be settled at once and the portrait hung in the Library.

Mr. Wilson thought the General Purposes Committee should have the power of selecting the most suitable position. If the report of the Committee were adopted all that was necessary would be done.

The report was then adopted.

Report of Committee appointed to consider the question of recognition of Colonial and Foreign Colleges.

The *President* stated that in accordance with the Veterinary Surgeons Act of 1881 it was necessary that the Royal College of Veterinary Surgeons should recognise certain schools whose graduates it might deem to possess the requisite knowledge and skill for the purpose of practising the veterinary art. Four applications had already been made, two from the Bombay School, one from Ontario, and the other from Victoria. The Council had received a diploma from some, but of course it was no guide whatever as to the period of study which the graduates in those schools had passed through, nor was it any indication of the nature and extent of education to which they had been submitted. It was quite impossible therefore for the Committee to take any further steps at the present time, but they had suggested that the Secretary should be instructed to write to the various colonial and foreign schools to obtain prospectuses with a view of determining the nature and extent of the educa-

tion which they afforded to their graduates, and the period of study through which they passed. It was a very important question, inasmuch as so soon as they recognised a school they would be compelled to recognise graduates of that school on the payment of a sum not exceeding five guineas as a registration fee. It would then be competent for such graduates of foreign and colonial schools to enter into competition with them in this country as practitioners of the veterinary art. The Committee did not see their way clear to make any suggestion at present, but as soon as they had obtained prospectuses of the various schools they could determine the respective merits of the different schools, and so would be in a position to recommend to the Council what schools should be recognised in the future.

Mr. Wilson moved the adoption of the report of the Committee.

Mr. Dray seconded the motion, which was agreed to.

Report of the Court of Examiners.

Professor Walley wished to ask one or two questions. He said that the Final Examination was divided into two sections, the Oral and the Practical, and if a student gained three "goods" or "very goods" in the Oral and failed to gain similar marks in the Practical, or *vice versâ*, those marks were not allowed to be placed on record in either of those parts against his name. He thought that was hardly in accordance with the spirit of the giving of honours. He considered that if a student passed the Oral Examination with great credit it should be recorded against him without any reference to the two parts, and the same in reference to the Practical part.

Professor Pritchard totally disagreed with the remarks of Professor Walley. He thought it would be straining a point if a man by his ability obtained great credit, or very great credit, in his Oral and failed in his Practical, to say that it was a double examination.

Professor Williams said that the whole subject wanted reconsideration. He thought that honours should be given to the men who had passed in all the subjects from the beginning with a majority of good marks.

Mr. Wilson said that now the question had been raised, it seemed to him that the other examinations wanted a little consideration as well as the Final. He thought the matter should be referred to some other, say the Bye-laws Committee, to consider the whole question.

Professor Walley said that if it was the wish of the meeting he would refer the whole matter to a small committee.

Mr. Wilson thought it was too much to expect a young man in the limited space of seven months to master such sciences as chemistry, botany, and anatomy. He would like to propose that

a committee should be formed for the purpose of considering the present condition of their examinations generally.

Mr. Simpson asked how the marks of honour were arrived at by the examiners in the C Examination.

Professor Walley.—By the biggest record in the Oral.

The *President* inquired whether it was a fact that the examiners in the Oral did not confer with those in the Practical as to the marks which the student should receive on completing his examination.

Professor Walley said there was not the slightest consultation whatever.

The *President* read the bye-law on that point, which is as follows:—"That the Final Examining Board shall consist of two sections, the first to conduct the Oral, and the second the Practical; and that their awards be disjoined."

Mr. Simpson thought the attention of the Examining Board should be called to that bye-law.

Professor Williams proposed, "That the examiners in Class C be instructed to confer honour or credit on all students who obtain a majority of 'very good' or 'good' marks in either section of the examination."

Mr. Simpson seconded the proposition.

Professor Pritchard moved as an amendment, "That no pupil be awarded honours who fails to pass either section of Class C Examination."

Mr. Hunting seconded the amendment.

Sir F. Fitzwygram did not understand whether it was intended that if a student gained honours in the Oral and failed in the Practical, but subsequently passed his Practical well and satisfactorily, he should be credited with passing in honours.

Mr. Wilson was strongly of opinion that the word "successful" should be inserted in the resolution.

Professor Duguid maintained that the examiners should not give their awards; that it should be an instruction to the Secretary and not to the examiners.

Some further discussion took place, at the close of which

Professor Williams proposed his amended resolution as follows: "That the Secretary of the Examining Board in Class C Examination be instructed to record honour or credit upon all successful students who have obtained a majority of 'good' or 'very good' marks in both sections of the examination."

Professor Walley seconded the resolution.

Mr. Hunting proposed as an amendment, "That the giving of credit marks to students at all examinations be left to the examiners as before."

The amendment was put to the meeting and declared carried, eight voting in its favour and seven against.

Consideration of Case of Charles Lawrence.

There being a quorum of members now present the Council

went into the consideration of the case of Mr. Charles Lawrence.

The *Secretary* explained that as there was not a quorum at the last Council meeting the case could not then be considered. It was now brought up again under the following circumstances: Mr. Charles Lawrence had been summoned before the Registration Committee to show cause why his name should not be struck off the Register. He had pleaded guilty to the charge of embezzlement. After due consideration the Committee recommended to the Council that his name should be removed from the Register under the Veterinary Act, and that his attention should be called to Clause 7 of the Act giving power for the restoration of names to the Register.

Mr. Thatcher read the notice of conviction, dated the 29th of April, 1887, of Charles Lawrence, on a charge of embezzling the sum of £10.

Mr. Barford moved the adoption of the report of the Registration Committee as far as the case of Charles Lawrence was concerned.

Mr. Kidd seconded the motion.

The clauses of the Veterinary Surgeons Act, 1881, dealing with the matter of the motion was put from the chair and passed, twenty-two members voting in its favour.

Report from the Court of Examiners for the Fellowship Degree.

The *Secretary* announced that the following gentlemen had passed the Fellowship degree on the 24th of April last:—Messrs. J. E. Peele, J. G. Parr, G. J. Pickering, R. C. Irving, and D. M. Storrar.

Appointment of Examiners for the Fellowship Degree.

Mr. Simpson moved the re-appointment of the present examiners.

Mr. J. R. Cox seconded the motion.

Mr. Dray suggested that Mr. Cox's name be added.

Mr. Cox, in declining, said he much preferred the examining body should stand as before.

The resolution was agreed to.

Appointment of Committees for the Year.

Mr. J. R. Cox said he desired, in view of any inconvenience that might arise, that his name should not be associated with the committees about to be appointed. He had heard of late the insinuation and suggestion that the profession had now become dissatisfied with what had been termed the dual appointment—the office of examiner and the membership of the Council—in other words, that the honour of being examiner was now considered to render the individual undesirable to assist the Council for the advance, honour, and welfare of the profession. If that proposition was tenable, the sooner the better should

men be sought who could be trusted honorably to perform the functions of the two responsibilities. In furtherance of his desire to serve their cause as best he might, he had endeavoured to inform himself to what extent the views that had been urged were the views of a very considerable and important part of the profession. He found that on the occasion of his being elected to office there were something less than 700 members who voted, and that of that number between 500 and 600 paid him the high compliment to invite his services again on the Council, knowing very well that he was on the Examining Board. He could not but consider that he should be breaking faith with a very great majority of the profession if he were to resign. It was his duty to stick to the ship. He took it that those of their members who exercised their right to assist in the appointment of members of the Council, and who took the trouble to record their vote, were representatives of the profession. At the same time it would be a matter of satisfaction to him to be the first to bow to the wishes of the profession and to leave a seat on the Council vacant. He desired also to say that he was sorry to see that the question of the regrettable errors enacted at Edinburgh had again been revived in print. It was a pity that that matter had not been allowed to remain in oblivion, but as it was revived in print, some action must come from the Council. It was to the lasting regret of all the members of the Examining Board at that time, that in opposition to the desires and to the strict order of the Council, its solicitations and challenge were glossed over. That solicitation and challenge was that there should be such a strict investigation as should probe to the bottom and unearth the root of all that had been at fault. At that time the Council was in correspondence with the Lord Provost of Edinburgh. The official communication from the Council was to urge two inquiries. It was further to propose a scheme by which a perfectly impartial investigation should take place, and to this day the official document remained unanswered, and to this day the College was under the ban of disrespect and discourtesy—some called it insult—in the ignoring of its communications.

Parliamentary Committee.

Mr. Simpson moved the re-appointment of the Committee of last year, with the addition of the names of Messrs. Lambert and P. Taylor.

Mr. Wilson seconded the resolution, which was agreed to.

General Purposes Committee.

Mr. Mulvey moved that it be as last year, with the addition of Messrs. Woods and Taylor.

Mr. Wragg proposed Mr. Hunting and Professor Pritchard, and the resolution with the additions was agreed to.

Registration Committee.

Mr. Mulvey moved that it be as last year, with the addition of Professor Pritchard, Messrs. Perrins, Taylor, and Lambert.

The resolution was agreed to.

Bye-laws Committee.

Mr. Mulvey moved that it be as last year, with the addition of Sir H. Simpson, Professor Pritchard, and Mr. Kidd.

Mr. Wragg proposed Mr. Hunting.

The resolution with the additions was agreed to.

Finance Committee.

Mr. Dray moved that it be as last year, with the addition of Professor Pritchard, Dr. Fleming, Mr. Briggs, and Mr. Taylor.

The resolution was agreed to.

Dinner Committee.

This Committee was re-appointed, with the addition of the names of Professor Pritchard, Mr. Lambert, and Mr. Hunting.

Committee appointed to consider the question of the recognition of Colonial and Foreign Colleges.

Mr. Simpson moved that it be as last year, with the addition of the names of Mr. Hunting and Mr. Lambert.

The resolution was agreed to.

Mr. Mulvey moved that the names of the Council and of the members of committees be printed and circulated.

The resolution was agreed to.

Notices of Motion.

Mr. Wilson gave notice of the following motion for the next meeting :—" That section 2, p. 61, be amended thus, by striking out the first sentence and substituting in lieu thereof :— 'Students who do not produce one or other of the certificates referred to shall be examined by a Board of Examiners appointed by and under the direction and supervision of this College, to whom they shall report the result of the examinations, which shall be uniform and applicable to the whole of Great Britain.' "

Mr. Briggs said that at the next quarterly meeting of the Council it was his intention to bring forward for discussion the subject of instituting a written examination in addition to the present Oral and Practical Examinations.

Professor Walley announced that at the next quarterly meeting he would move that the present percentage of marks, viz. thirty, should be raised to fifty.

Mr. Hunting announced that he would move a resolution at the next meeting that every candidate for the diploma should produce a certificate of birth before being put on the list.

Surplus Funds.

Sir F. Fitzwygram suggested that some of the surplus funds

of the College should be expended on putting down a wooden pavement in front of their building in Red Lion Square. The cost would, he understood, be about £300.

Professor Walley suggested that in the matter of surplus funds the Council should take into consideration the foundation of scholarships for veterinary students.

SPECIAL MEETING.

The meeting was then made special to consider the undermentioned notice of motion by Professor Brown:

"In line 5 leave out the words 'be allowed to.' In line 6 leave out all the words after 'Practical,' and all the other lines of the paragraph to the end, and add 'He may present himself at any succeeding Practical Examination which may be held during a period of three years from the time of his rejection."

Professor Brown, in moving the above resolution, said that the effect of it would be that a student who had been rejected at the Oral Examination would do exactly what he pleased, as now, in reference to going back to the College, or going with a member of the Royal College of Veterinary Surgeons; but if he took the latter course he would not be compelled to return to the College for one month previous to the next examination. That part of the law had operated very unsatisfactorily. He therefore proposed that it should stand in this way,—that in the event of a student being rejected at his first Practical Examination he might present himself at any succeeding Practical Examination which might be held during a period of three years from the time of his rejection.

Professor Williams seconded the resolution.

Mr. Simpson would like to take the opinion of the members as to the advisability of adopting the course proposed. It seemed to him that the resolution, if passed, would give to the principals of the schools power to say to the students, "You have failed to pass your Practical Examination, and we have done with you; we have no more to do with you; put yourselves in communication with the Royal College of Veterinary Surgeons, throw the responsibility upon them of advising you when your Practical Examination takes place, and take your chance of passing." But so long as they had honorable men like they were at present they need have no fear of that, but he ventured to think that such a time would come. He therefore would like to hear the opinions of some other members of the Council as to what they might consider the right course to adopt, and whether they would allow the teaching institutions to say to the student, "It is no business of ours to educate you up to the standard of the Practical Examination. Pass your Oral and we have done with you; go and get your practical knowledge where you will."

Professor Walley ventured to suggest that in the event of a

change taking place in the heads of the establishment the Council could certainly have sufficient notice to prevent anything of the kind suggested by Mr. Simpson from taking place. It was an easy matter to alter a bye-law at any time.

Professor Brown's resolution was then put and carried.

A vote of thanks to the Chairman terminated the meeting.

SPECIAL MEETING OF THE COUNCIL, HELD JULY 10TH, 1889.

Professor J. Wortley Axe, President, in the chair.

Present :—Professors G. T. Brown, W. Duguid, W. Pritchard; General Sir Frederick Fitzwygram; Dr. George Fleming; Messrs. J. Roalfe Cox, W. Mulvey, H. R. Perrins, F. W. Wragg, W. Wilson; Mr. George Thatcher (solicitor), and the Secretary.

The *Secretary* read the notice convening the meeting.

The *Secretary* stated that he had received letters from Professor Walley, Messrs. Briggs, Kidd, and Woods, regretting their inability to attend the meeting.

On the motion of *Professor Pritchard*, seconded by *Mr. Wilson*, the minutes of the previous meeting were taken as read and confirmed.

The *President* said that the meeting had been called to confirm the under-mentioned alteration of Regulation 7 for the Professional Examinations proposed by Professor Brown, and carried at a special meeting of the Council held on the 1st of July, 1889 :—"In line 5 leave out the words 'be allowed to.' In line 6 leave out all the words after 'practical,' and all the other lines of the paragraph to the end, and add 'He may present himself at any succeeding Practical Examination which may be held during a period of three years from the time of his rejection.'" He begged to propose that the resolution as passed at the last meeting be confirmed.

Mr. Wragg seconded the motion, which was carried unanimously.

General Sir Frederick Fitzwygram said that there was one point he should like to bring before the meeting. A great deal of confusion seemed to arise from one examination being called the "Oral" and the other being called the "Practical." Both examinations were oral, and he thought it would be advantageous to change the name of the first examination, namely, the Oral, to "the Theoretical Examination," and the other "the Practical." It was true that the gentlemen sitting round the table understood that the Oral Examination meant the Theoretical, and that the Practical meant what it expressed, and he did not think the term "Oral" Examination conveyed a very clear idea, and the change in that name therefore would be advantageous.

The *President* suggested that perhaps General Sir Frederick Fitzwygram would bring the matter forward at a future meeting.

General Sir Frederick Fitzwygram said he simply wished to throw out a suggestion in order that it might be taken into consideration, and he would hand in a notice of motion at the next quarterly meeting.

The proceedings then terminated with a vote of thanks to the President.

CENTRAL VETERINARY MEDICAL SOCIETY.

An ordinary general meeting of the above Society was held at the First Avenue Hotel, Holborn, on July 4th, 1889. In the unavoidable absence of the President, the senior Vice-President (Mr. Frank Wragg) occupied the chair.

The minutes of the previous meeting were confirmed, and correspondence was read from Messrs. S. Harrison, Henry Edgar, and Henry Withers; also a letter from Mr. Hall Brown, jun., tendering his resignation on account of his being unable to attend the meetings.

On the motion of *Mr. Hurndall*, seconded by *Professor Pritchard*, the resignation was accepted with regret.

The *Chairman* then called on the Honorary Secretary to read the Report of the Special Committee on the Education and Examination of Veterinary Students.

The resolutions adopted by the Committee were as follows:

1. "That the Matriculation Examination should be of a uniform standard for all schools, and of a more stringent character than at present."
2. "That a separate table be established in Materia Medica and Therapeutics at the Final Examination."
3. "That Hygiene be included as a special subject for examination."
4. "That the existing 'A' Examination be merged into that of 'B.'"
5. "That a written examination be added to the Oral."
6. "That if a written examination be adopted, the questions asked be subsequently published."

The report having been received, *Mr. Raymond* expressed his regret at being unable to adopt Mr. Hunting's scheme of two examinations only instead of three, his chief reason being that he considered it unfair to expect a student to have at his finger ends for the momentous forty minutes of the examination such a mass of information as is represented by Anatomy, Chemistry, Physiology, Botany, and Hygiene, and he asserted most strongly that if the examination was at all searching it is too much to expect of any student. Rightly or wrongly it is said on all hands that students

are now below par, and that a very low percentage of correct answers will procure a pass. If this be true, how can one expect to improve the state of affairs by concentration? If the average student is weak when examined on two or three subjects, how is he to be stronger if tackled on five or six, even with a little more time? He pointed out that the extra time given "cuts both ways," for it is possible to forget a good deal during a six months' run in the country. He would put himself in the position of a student, and as such he would much prefer the three examinations to the two.

A large section of Mr. Hunting's supporters were entertaining a well-founded fear that the profession is greatly overcrowded, and welcomed any scheme which would be likely to exercise a check. As Mr. Hunting says, "We have no special desire for the influx of new recruits." Now, we have a perfect right to prevent overcrowding if we do so by fair means, but the profession should not forget that it owes a duty to the public and to young men who enter as students, and neither are likely to submit to our checking the supply of veterinary surgeons by sharp practice. But a great many of Mr. Hunting's supporters go even further, and demand that the examinations shall also be made more stringent, so it comes to this,—the student who is said to be hardly able to blunder through two subjects when leniently treated is to be allowed a periodical run at grass, in order that he may get out of gear and forget as much as possible of what he has learnt. He is then to be taken up and examined on five or six instead of two or three subjects, and the examination is to be made much more stringent. If the Council should adopt this idea he was afraid the students and the public would treat us to clamour of the Edinburgh sort, and the examiners would have to eat dirt, or, in other words, the standard would be quietly lowered, and the object of the profession defeated. There is a good deal of talk about cramming, but really there was no examination passed without cramming unless it be when a horse is examined for soundness.

The problem the profession desires to have solved is—How is the efficiency of the student to be increased? How is overcrowding to be prevented? He feared the question of overcrowding was far more difficult to answer than the other. He considered the time was rapidly approaching when the tinkering system will have to be dropped, and the question of efficiency boldy faced. The fact is that our profession has made such rapid strides that it is gaining popularity amongst a more numerous and higher social class. The most casual observer could see this if he would only visit Camden Town. Many members of this class were not so accustomed to animals as they ought to be, and they therefore experienced more difficulty at starting in practice. On the other hand, they are better provided with means to go through a lengthy curriculum.

The suggestions which he would offer were based on the above, and were:—Raise the entrance fee to the schools (the Melbourne College fee is £105). It is all very well to talk of the poor man,

but those who desire the profession to rise must endeavour to get hold of the best material to work on, and where it is a question of rising socially the man with some means will have the better chance. In fact, the increased demands of the public require higher proficiency and therefore longer study, and longer study entails more expense. Raising the school fees will thus tend to procure a better class of man.

Secondly.—Make the preliminary examination more stringent. When he (Mr. Raymond) entered, and probably the same obtained now, it was a mere farce. Some of the more advanced of the professors are in favour of this measure, and recently Professor McFaydean pointed out that the Council should have remedied this before.

Thirdly.—Make the curriculum longer, say four years as in France and elsewhere.

Fourthly.—Make the Practical Examination very stringent, and include equitation up to riding a quiet horse over a hurdle. These measures should come into force, say five or seven years hence, so that no one may suffer by the innovation.

Mr. Raymond continuing, said it seemed to him that all these items were perfectly fair, and if adopted would help to prevent overcrowding, at the same time raise the standard of the profession to a higher level. The fourth resolution, which he objected to, was really a plausible dodge to make things more difficult at the examination tables, and thus to check the flow of men into the profession. He was convinced that we should have to come to the measures he had suggested sooner or later, and the sooner our minds were made up the better for all concerned. In conclusion, Mr. Raymond proposed, "That the fourth resolution of the Committee's report be referred back to the Committee for revision."

In reply to the Chairman, Mr. Raymond said he approved of all the resolutions of the Committee except the fourth. He wished to emphasise this, as somehow it had been reported in the professional journals that he was adverse to the adoption of written examinations, whereas he personally thought such an innovation would be most beneficial.

Mr. Wright seconded Mr. Raymond's proposition, fully agreeing with the remarks that gentleman had made, except that instead of an examination in equitation he would have one in practical dispensing.

Professor Pritchard considered that instead of submitting the report to the Royal College of Veterinary Surgeons it should be presented to the principals of the schools, as it had solely to do with the education of the students.

Mr. Rowe anticipated that if it were sent to the Royal Veterinary College it would be simply laid on one side, and he felt that it had been altogether a waste of time by the Committee, and he was not sorry that he had not personally taken a more active part on the Committee.

Mr. Hurndall said the Committee had some little confidence

that their report would be courteously received, but he considered it should be presented to the Council of the Royal College of Veterinary Surgeons. If the Council, which was the head of the profession, gave an opinion on the subjects, the schools would follow in its wake. He was certainly not disposed to allow Mr. Raymond's motion to pass unchallenged, and to save time he proposed as an amendment "That the report be adopted as it stands."

Mr. Rowe was more inclined to support the report as read than to support Mr. Raymond's views. To double the fees was to rob the parents of the students, but he could not cordially second the adoption of the report, because he objected to its first clause. He considered the standard of education at present demanded from young men entering on their professional studies quite sufficient, and he would move as a further amendment "That Clause 1 of the report be expunged."

Mr. Hurndall considered the first clause of quite as much importance as any other, and he could not personally accept Mr. Rowe's amendment, for he wanted to see men entering the colleges who had made good use of their time at school. Such men were well prepared to take in the subjects they would have to study, and such would also be able to take a more prominent position in society.

Mr. Wright asked Mr. Hurndall if he wished the matriculation examination to be on a par with that of the medical schools.

Mr. Hurndall replied that it was very desirable that they should be more alike than at present.

Mr. Rogers cordially seconded Mr. Hurndall's resolution, that the report be adopted as it stood.

Mr. Rowe's amendment was not seconded, and the original amendment on being put to the meeting was carried.

Mr. Hurndall considered that the report should be preceded by a summary of the course the Society had adopted from the commencement of the consideration of the matter.

Mr. Raymond suggested it should be referred back to the Committee to consider what should be done with the report.

Professor Pritchard again expressed his opinion that it should be sent to the principals of the schools.

The *Hon. Secretary* thought there would be a difficulty in getting another committee meeting as was suggested, for its members had already given a great deal of time and had thoroughly considered its report, and he begged to move, "That the resolutions as suggested by the Committee and approved at that meeting be presented to the President and Council of the Royal College of Veterinary Surgeons."

Mr. Wragg said that was no doubt the intention of the Society when it appointed the Committee, and of the Committee when it considered the subject.

Mr. Hurndall seconded the Secretary's proposition, which was carried.

The *Chairman* suggested the report should take the form of a memorial, which was agreed to.

Mr. Raymond thought the whole of the supporters of the resolutions should form a deputation to present the report, but subsequently proposed that the mover and seconder of the resolution, together with the President of the Society, should draw up the memorial and present it to the Council.

Mr. Oatway seconded, and it was so agreed.

A vote of thanks was accorded the Chairman.

SIDNEY VILLAR, *Hon. Sec.*

SOUTH DURHAM AND NORTH YORKSHIRE VETERINARY MEDICAL ASSOCIATION.

A MEETING was held on Friday, July 5th, at the North-Eastern Hotel, Darlington, when it was decided to form a new association, to be called the South Durham and North Yorkshire Veterinary Medical Association; that its meetings be held quarterly, and that the annual subscription be 10*s.* 6*d.*

Seventeen members were enrolled, and the following officers were elected, viz.:

President.—Mr. J. Nettleton, Northallerton.

Vice-Presidents.—Mr. G. J. Pickering, York; Mr. J. G. Deans, Bishop Auckland.

Treasurer.—Mr. F. R. Stevens, Darlington.

Secretary.—Mr. W. Awde, Stockton-on-Tees.

Auditors.—Mr. G. E. Nash, Richmond; Mr. H. Gelsthorpe, Darlington.

Messrs. Stevens, Gelsthorpe, Briggs, Nash, and the Secretary were appointed as a committee to draw up the rules.

It is expected that the first regular meeting will be held in September (notice of which will be given), when the President will deliver his inaugural address.

W. AWDE, *Hon. Sec.*

Parliamentary Intelligence.

PLEURO-PNEUMONIA—COMPENSATION FOR SLAUGHTERING CATTLE.

HOUSE OF COMMONS, *July 15th.*

Major Rasch asked the First Lord of the Treasury whether the Government would, during the recess, take into serious considera-

tion the advisability of paying compensation for slaughter in outbreaks of pleuro-pneumonia out of a central fund instead of county rates, having regard to the extreme unfairness of the present system towards the agricultural interest.

Mr. H. Gardner asked whether the Government possessed any information as to any attempt to conceal cases of pleuro-pneumonia owing to the fear of increasing the rates of the locality where the cases occurred, and whether, as the stamping out of pleuro-pneumonia was a matter of Imperial interest, he would consider the advisability of charging the compensation on the Imperial Exchequer.

Mr. W. H. Smith.—The Government will be prepared during the recess to take into consideration the question to which my hon. and gallant friend has called attention, but I would remind him that the question is not by any means a new one, and that it has more aspects than that which is put forward with justice. I have no personal knowledge that would enable me to answer the first question of the hon. member opposite.

MUZZLING OF DOGS.

Sir H. Roscoe asked the First Lord of the Treasury whether any order had yet been issued by the Privy Council as to the general muzzling of dogs throughout the country, in face of the fact of the large number of cases of rabies which had recently occurred; and what powers existed for the destruction of stray dogs by Local Authorities.

Mr. W. H. Smith.—It has not been deemed expedient to pass a general order at present, but the Privy Council have issued an order requiring the muzzling of all dogs within the metropolitan police district (a radius of fifteen miles from Charing Cross) from August 1st to December 31st. The returns of rabies in the metropolis and neighbourhood during the first six months of 1889 show a steady increase of the disease. The police in the metropolis have power to destroy stray dogs, but Local Authorities generally have no such power under the Dogs Act of 1871, unless a mad dog or a dog suspected of being mad is found within their jurisdiction. It is possible that some local Acts may give Local Authorities greater power, but the Privy Council have no information on the subject. Under the Contagious Diseases (Animals) Act of 1878, the Privy Council can only sanction the detention, but not the destruction, of stray dogs.

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PROFESSOR WILLIAMS, F.R.S.E., F.R.C.V.S., F.R.P.S., PRINCIPAL,
Ex-President of the Royal College of Veterinary Surgeons, Professor of Veterinary Surgery to the Highland and Agricultural Society of Scotland, Examiner for B.Sc. Degree in Agriculture, University of Edinburgh; Foreign Correspondent of the Société Centrale de Médecine Vétérinaire, Paris, &c., &c.

PHYSIOLOGY AND PRACTICAL HISTOLOGY,
PROFESSOR JAMES HUNTER, F.R.C.S.E., L.R.C.P.E., F.R.A.S., Lecturer on Physiology, Edinburgh Medical School.

ANATOMY OF THE DOMESTICATED ANIMALS,
PROFESSOR LEWIS, F.R.C.V.S.

DISEASES OF THE OX, SHEEP, PIG, AND DOG
PROFESSOR W. OWEN WILLIAMS, F.R.C.V.S., F.R.P.S.

CHEMISTRY, PRACTICAL CHEMISTRY, AND TOXICOLOGY,
PROF. IVISON MACADAM, F.C.S., F.I.C., Lecturer on Chemistry, Edinburgh Medical School.

MATERIA MEDICA AND THERAPEUTICS,
PROFESSOR LEWIS, F.R.C.V.S.

BOTANY,
PROF. A. N. M'ALPINE, B.Sc. (London), Lecturer on Botany, Edinburgh Medical School.

MORBID ANATOMY,
PROFESSOR W. OWEN WILLIAMS.

NATURAL HISTORY AND PARASITES OF THE DOMESTIC ANIMALS
PROFESSOR M'ALPINE.

PRACTICAL PHARMACY,
MR. E. F. DE JONG.

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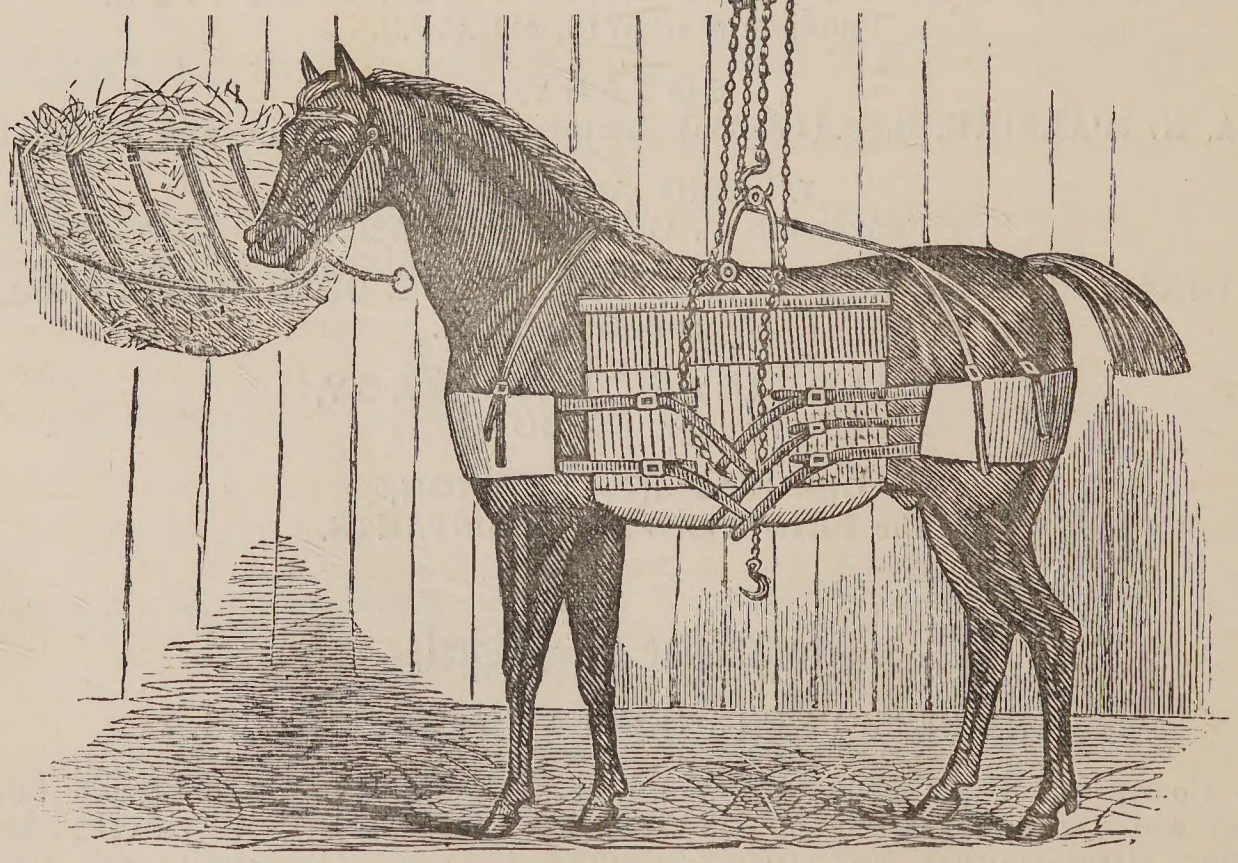

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A Subscription of *twenty guineas* entitles the Subscriber to all the privileges of the Institution, as a general Veterinary Establishment and Hospital for Animals, for life; and an annual payment of *two guineas*, to the same privileges during the continuance of such Subscription.

A Subscriber is entitled to have admitted into the Hospital for medical and surgical treatment, an unlimited number of Horses or other animals, his own property, at a charge only for their keep. Also, without the payment of fees, to have the opinion of the Professors as to the treatment of any animal he may wish to retain in his own establishment.

A Subscriber has likewise the privilege of having five horses examined *as to soundness* in the course of a year, and to receive the opinion of the Professors thereon, either verbally or in writing, free of charge; and also any further number at a fee of ten shillings and sixpence for each *extra* horse, or to have ten horses examined on payment, in addition to his Annual Subscription, of two guineas, or such other sum as shall from time to time be fixed by the Governing Body or General Purposes Committee.

The Professors do not examine horses for soundness out of the Institution, nor do they visit patients, except on very special occasions, and then only with the object of their being removed into the Hospital for treatment.

Members of the Royal Agricultural Society of England are entitled to all the privileges of the Institution, as appertaining to the diseases of Cattle, Sheep, and Swine.

The Hospital and general Practice of the College is conducted by Professors AXE and PENBERTHY.

The Hospital contains ample accommodation for upwards of 100 Horses, besides Cattle, Sheep, Dogs, and other animals. It is fitted up with large and airy Loose-boxes and Stalls; Hot, Cold, Douche, and Vapour Baths; Operating Rooms, Covered Exercising Ground, &c. Rooms are specially set apart as an Infirmary for Dogs.

ROYAL VETERINARY COLLEGE.

By the Royal Charter of Incorporation the GOVERNORS have power "to confer upon and grant to such of the Students of the said College as they shall think fit, *Annual or other Exhibitions, Scholarships, Medals and other Prizes and Certificates of Distinction.*"

A SCHOLARSHIP of £25 per annum, tenable for two years, was awarded for the year ending June 30th, 1888; and an additional Scholarship of the same amount will be awarded in 1889. Beside the COLEMAN PRIZE MEDALS; CLASS MEDALS, PRIZES AND CERTIFICATES are given in each division of the Students' studies.

In addition to these Prizes the Royal Agricultural Society awards a *Silver* and a *Bronze Medal* to the two Students who may pass the best examination in the Pathology of Cattle, Sheep, and Pigs, at the Diploma Examination of the Royal College of Veterinary Surgeons.

The College Entrance Fee is 45 *Guineas;* the payment of which confers the right of attendance on *all* the Lectures and Collegiate Instructions. The fee may be paid in *three* instalments, viz., Twenty-five guineas on *entry*, Ten guineas at the end of the *first period* of study, and Ten guineas at the *second period* of study—the first instalment must, with the Matriculation Examination Fee of One guinea, as well as the Library and Reading Room Fee of One guinea, be paid prior to this Examination.

A Pupil, previously to his admission, is required to produce a recognised Certificate of Educational Acquirements, which must include all the pass subjects of the Matriculation Examination, or otherwise he must pass an Examination in *Writing, Reading aloud, Dictation, English Grammar, English History, Geography, Arithmetic, and French, German, or Latin.* A Pupil may also elect to be examined in any of the following subjects, *not exceeding two:*—Euclid, Books one and two; Algebra to Quadratic Equations inclusive; Natural History (Botany, Geology, or Zoology); Physiology; Chemistry; Physics; and the Greek, German, or Italian Languages.

The Educational Year is divided into a Summer and Winter Session of three terms, and begins on Oct. 1st and ends the middle of May.

Lectures, Clinical and Pathological, Demonstrations, and General Instruction, are given on Diseases of the Horse and other Domesticated Animals, including Epizöotics, Parasites and Parasitic Affections; also on Anatomy, Physiology, Histology, Chemistry (General and Practical), Materia Medica, Toxicology, Botany, Therapeutics and Pharmacy; Hospital Practice; Obstetrics; Operative Surgery, The Principles and Practice of Shoeing, &c.

Besides these Lectures and Demonstrations, the facilities which exist in the Institution are such as to enable Pupils, by attention to their duties, to acquire a well-grounded practical knowledge of their profession, and thus, on obtaining their Diploma, to at once merit the confidence of the public. This will become fully apparent when it is remembered that, for several past years, upwards of 2000 animals have been annually prescribed for and treated as GRATUITOUS PATIENTS *by the Pupils under the Supervision of the Teachers.*

In addition to the practical knowledge thus to be obtained, the pupils have the daily advantage of attending the Professors on their visits to the Patients in the Hospital, thereby becoming acquainted with the diagnosis and treatment of each individual case. Similar advantages are likewise enjoyed by them with reference to the Out-Patients. They also attend on the Professors in their Examinations of Horses for Soundness, the yearly average number of which exceeds 1000. It may be further added, as showing the advantage of the College for obtaining practical knowledge, that the number of animals admitted into the Hospital or treated as Out-Patients year by year exceeds 2000 or more than doubles those sent for examination as to soundness.

A Student, during his Academical Course, has to undergo *three* examinations by the Royal College of Veterinary Surgeons. To be eligible for the FIRST he is required to attend, *at least*, one Winter and one Summer Session; a second Winter and Summer Session before being eligible for the SECOND Examination, and a third Winter and Summer Session before being examined for the Diploma of the College.

The Examinations are held in May and December.

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J. BAYNE, Lecturer on Chemistry, Materia Medica, and Toxicology.
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